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Gas Journal

Vol. 268. 103rd Year. LONDON, OCTOBER 17, 1951. No. 4611. Price 1/3

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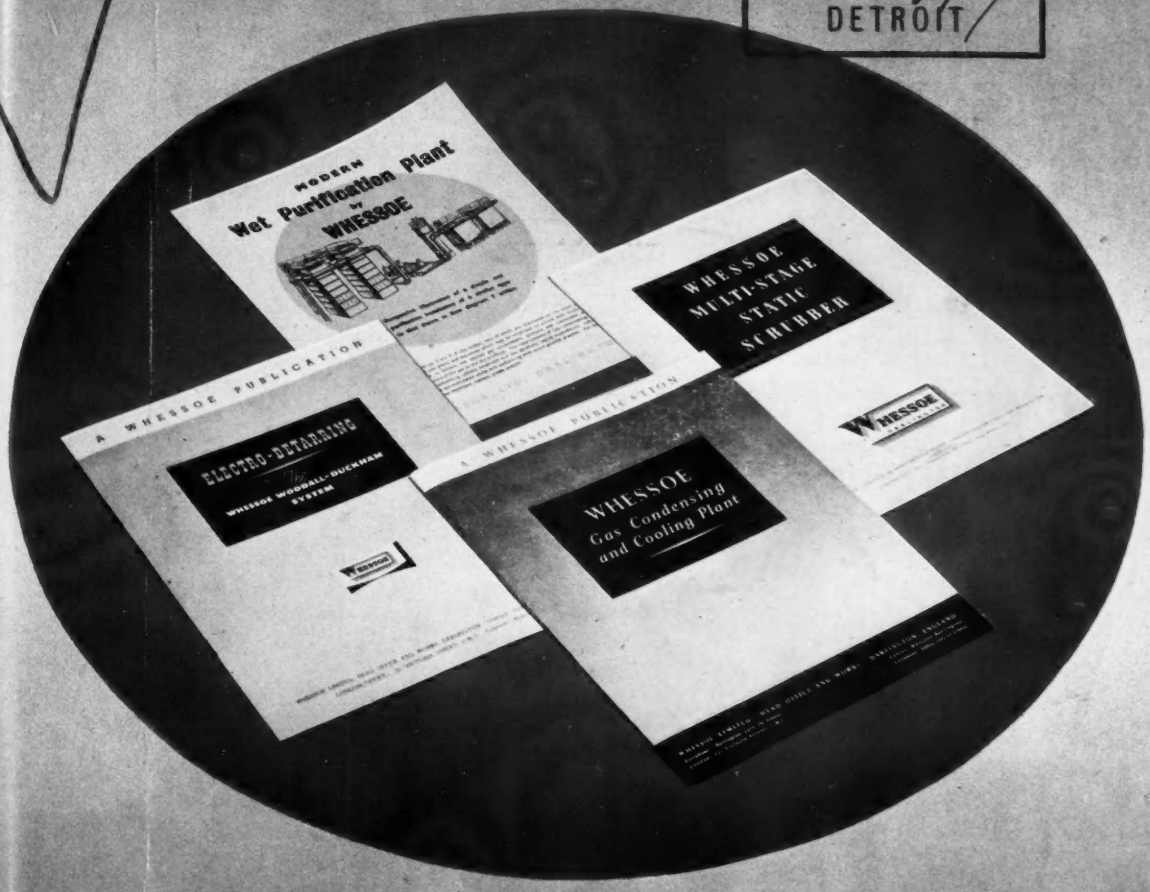

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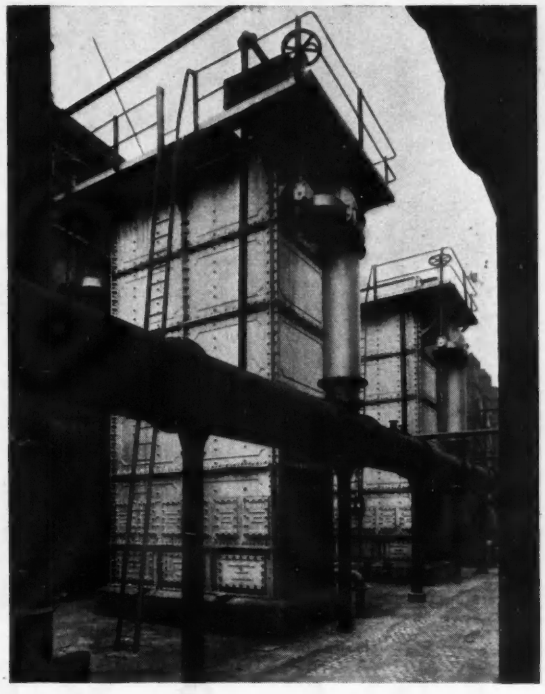

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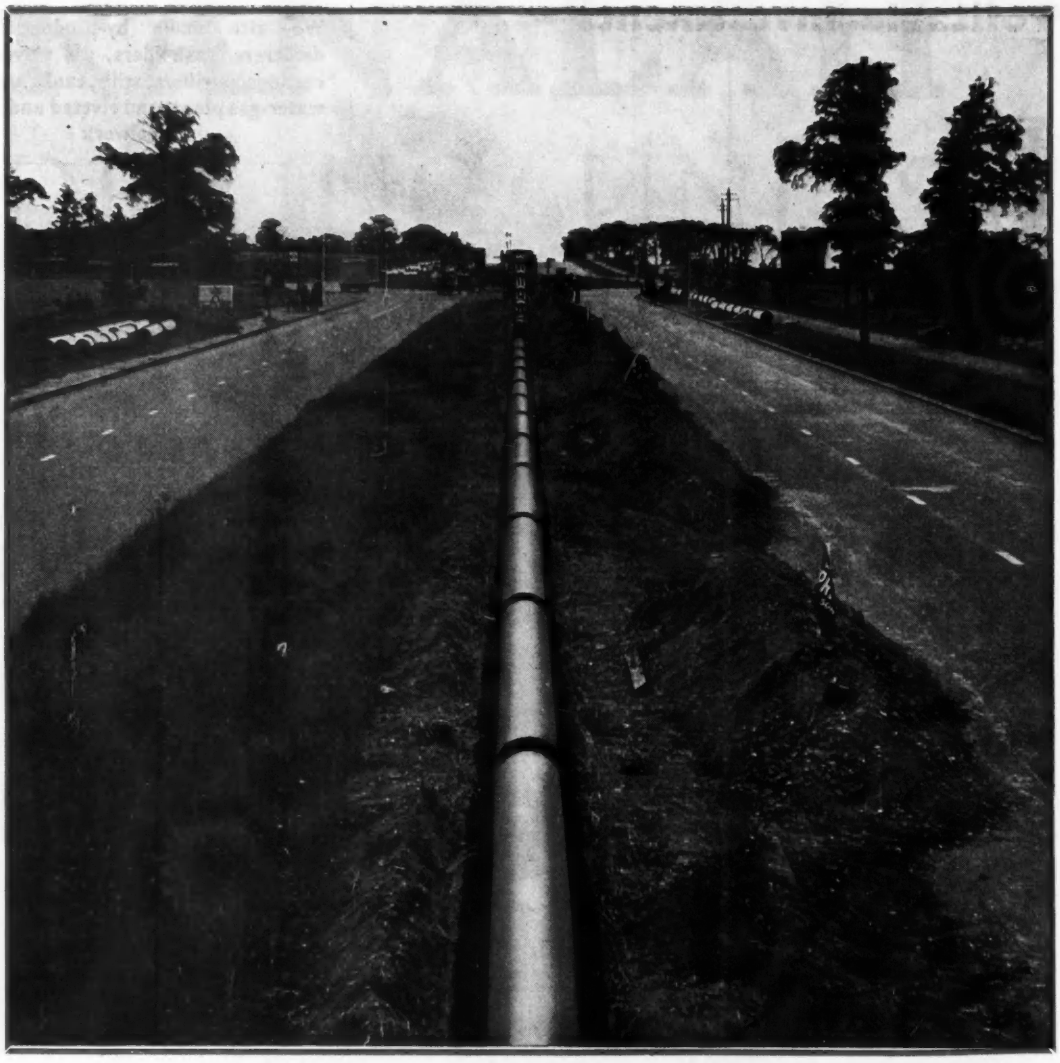

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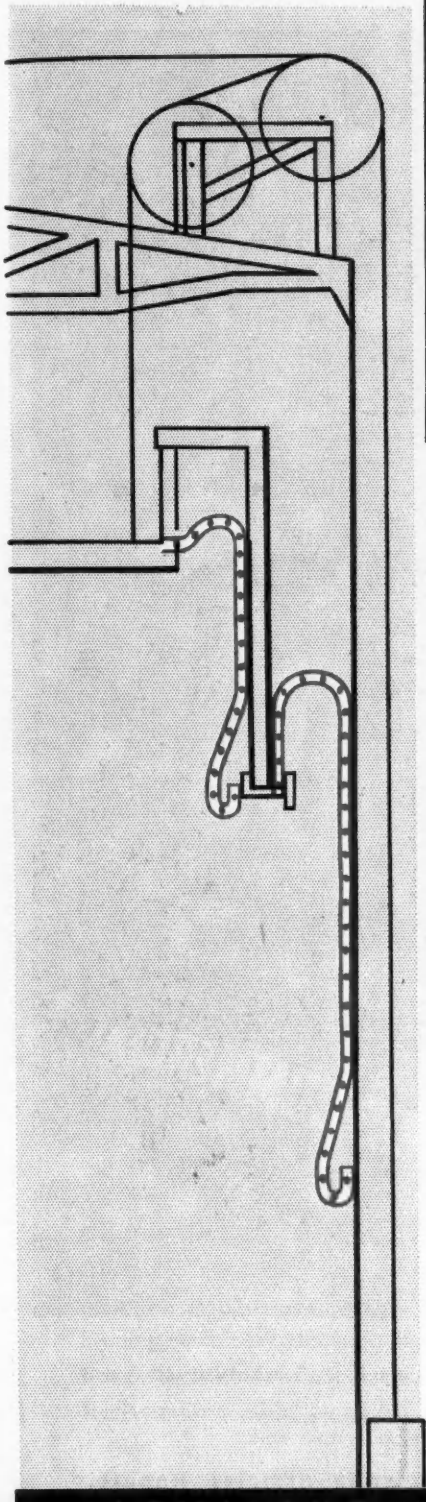

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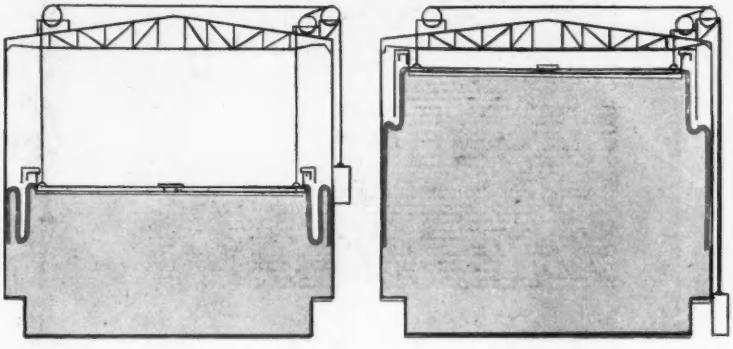

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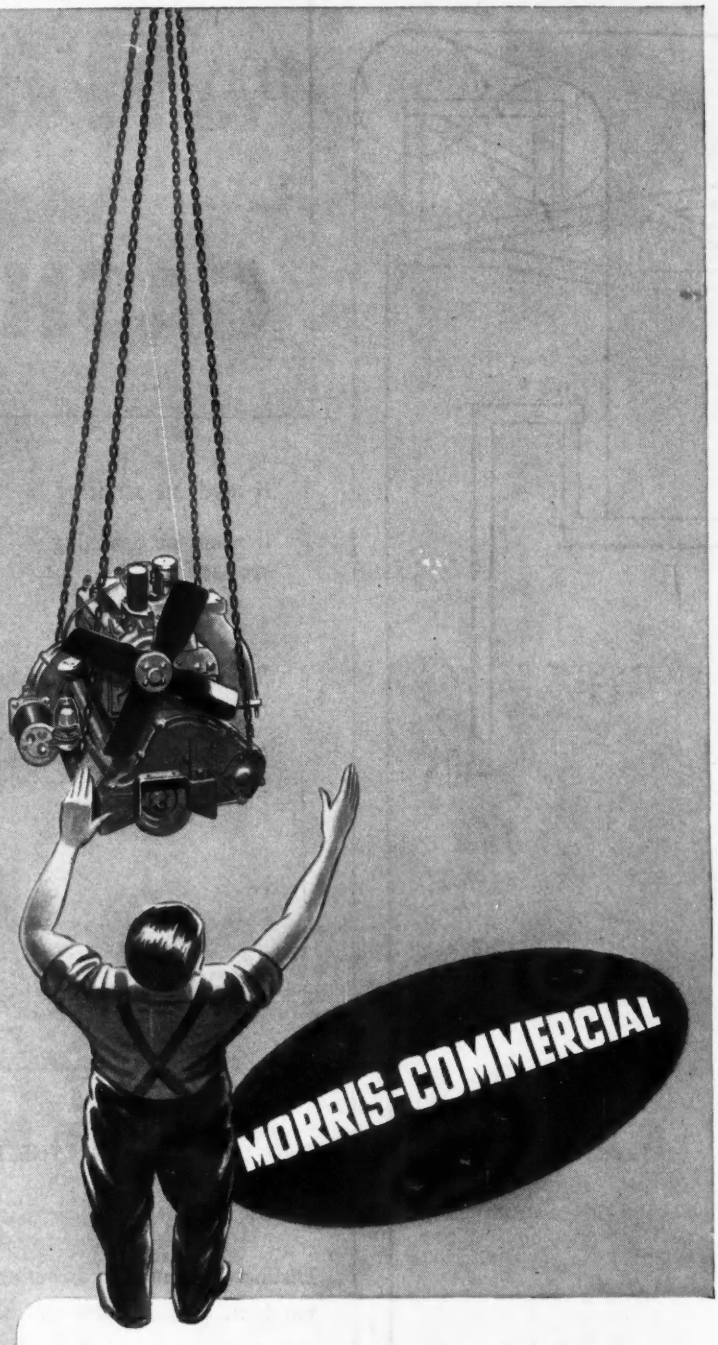

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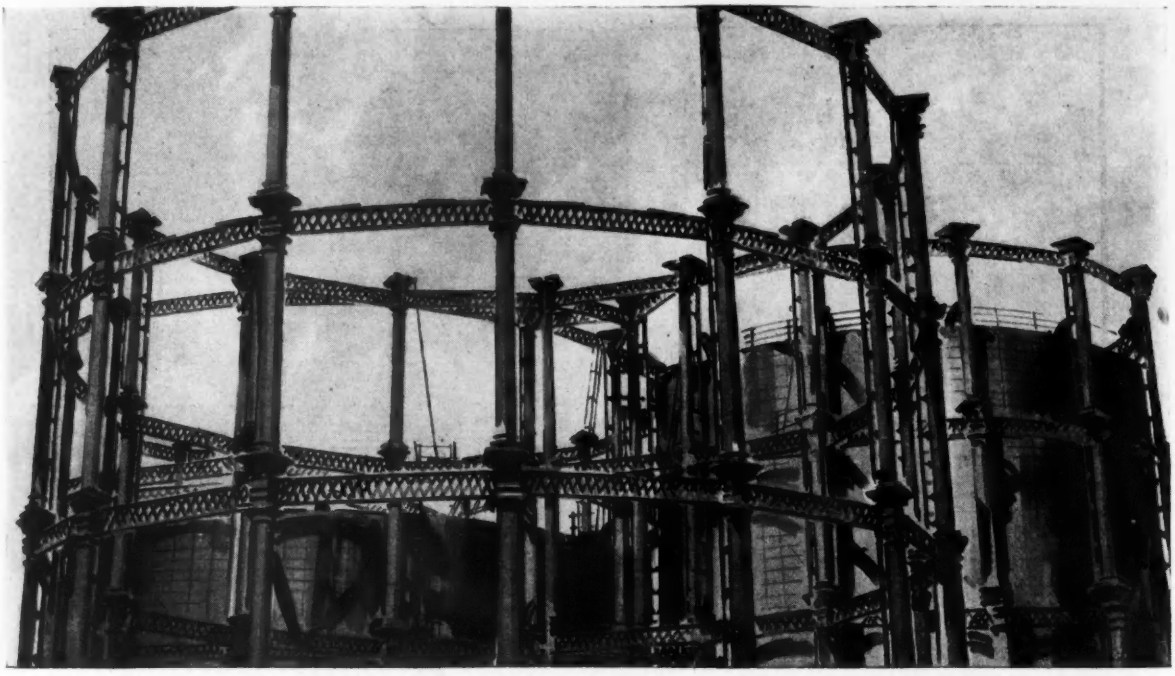

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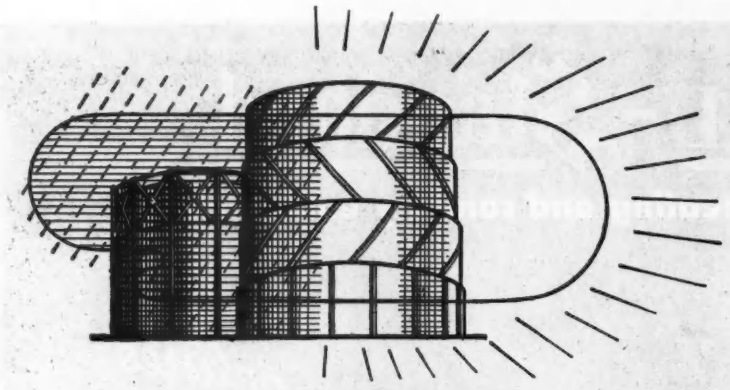

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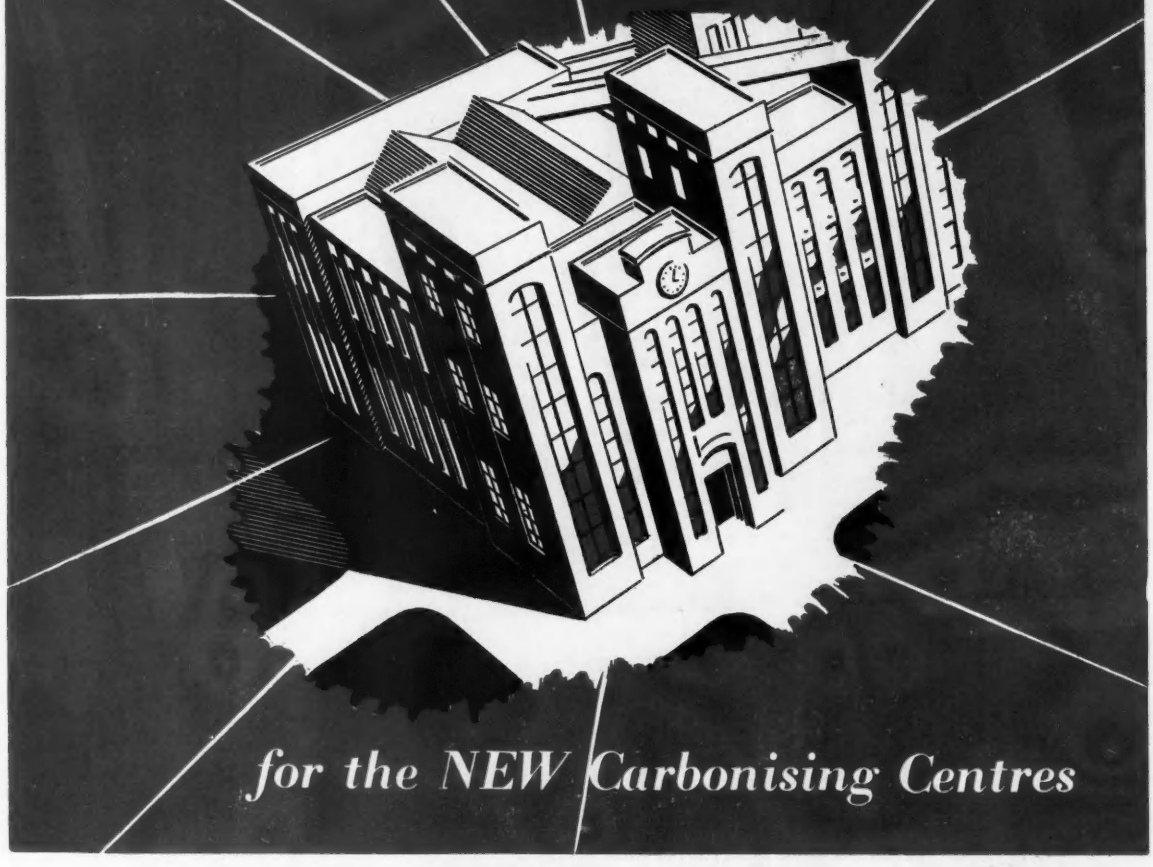

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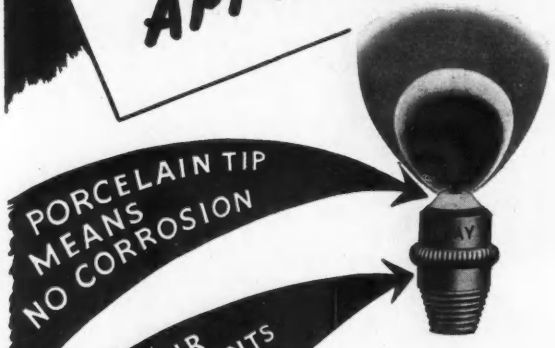

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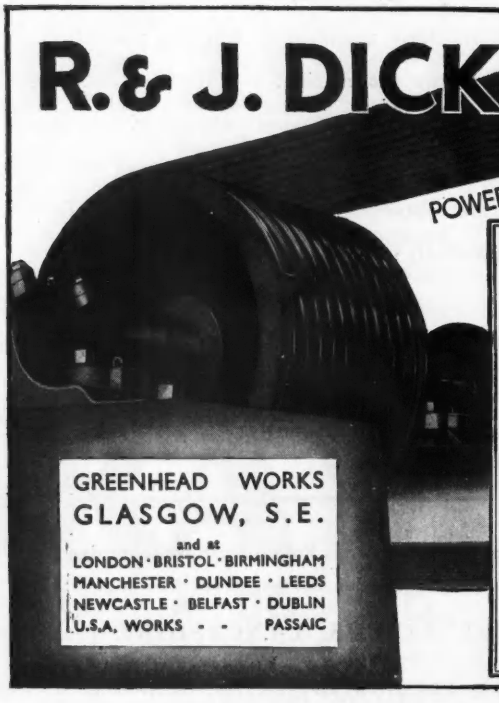

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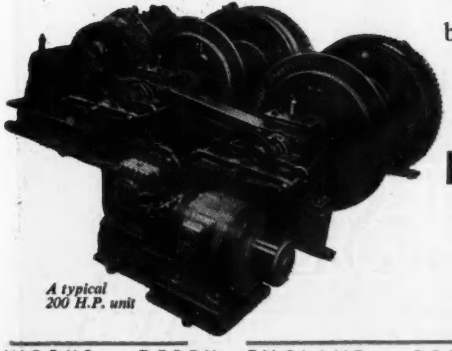

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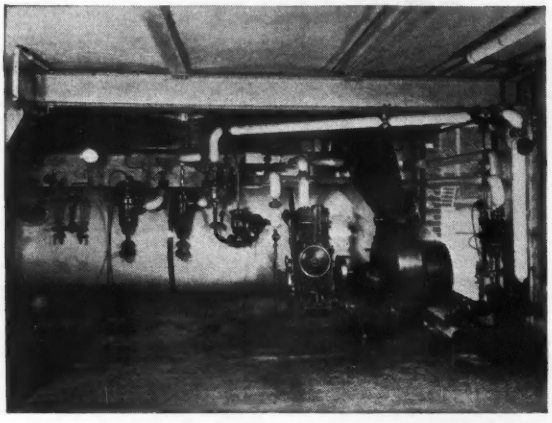

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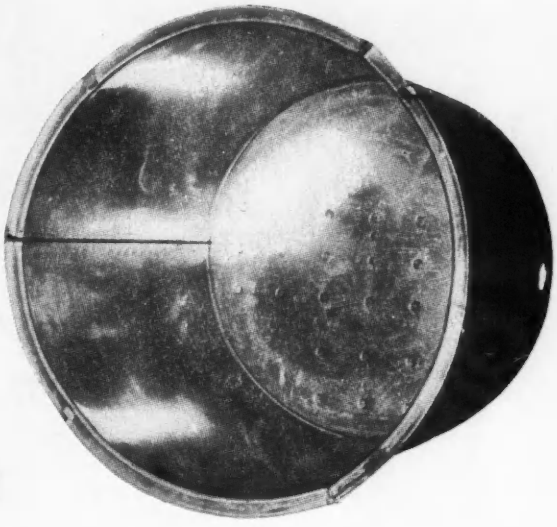

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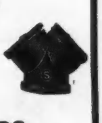

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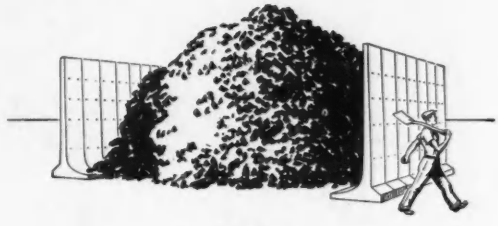

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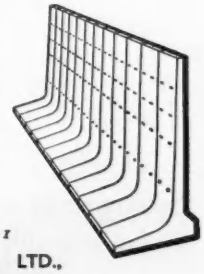

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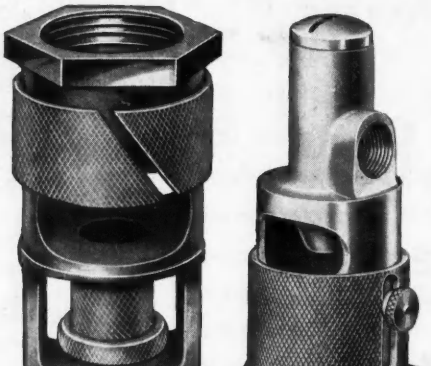

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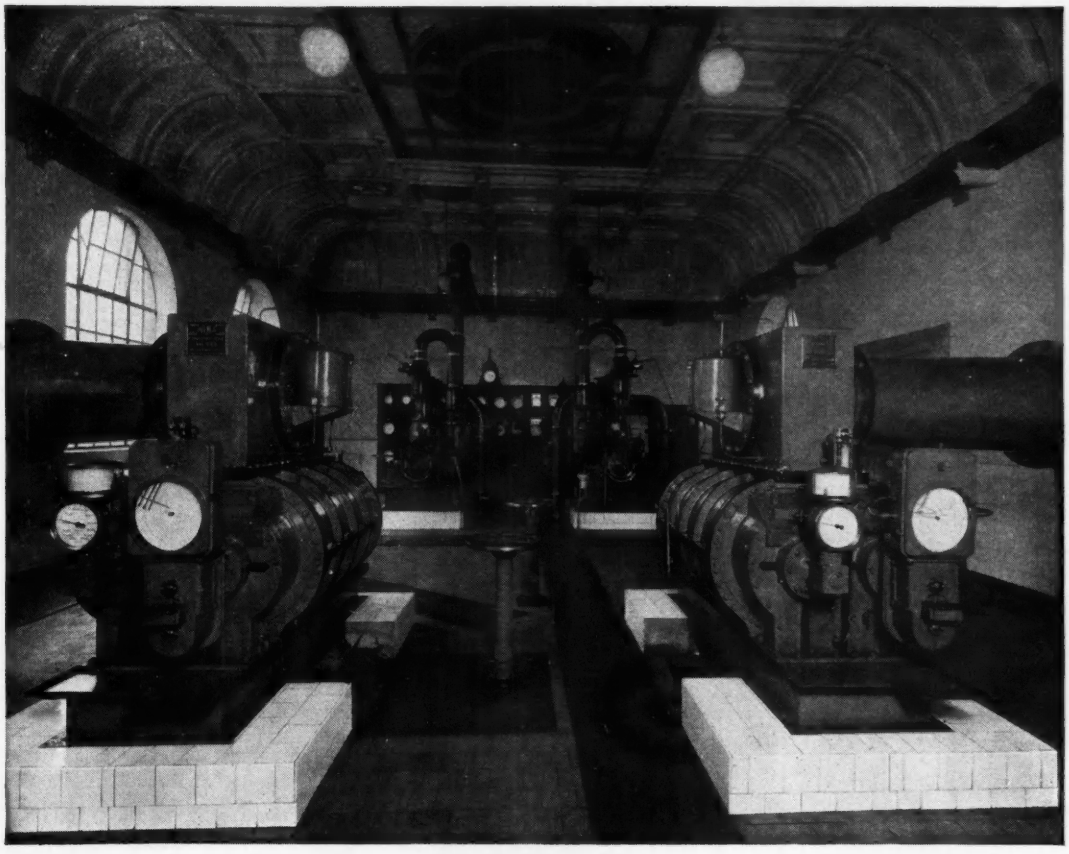

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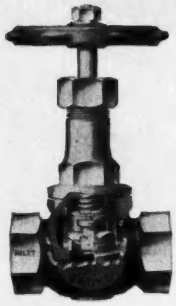

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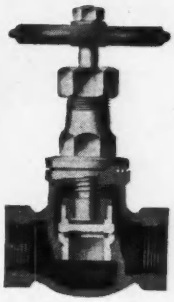

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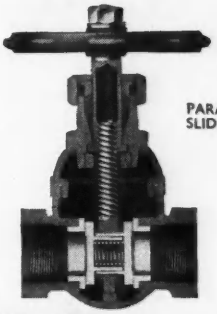

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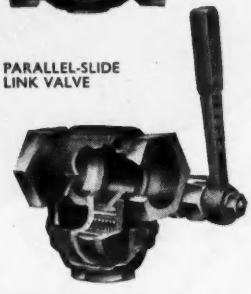

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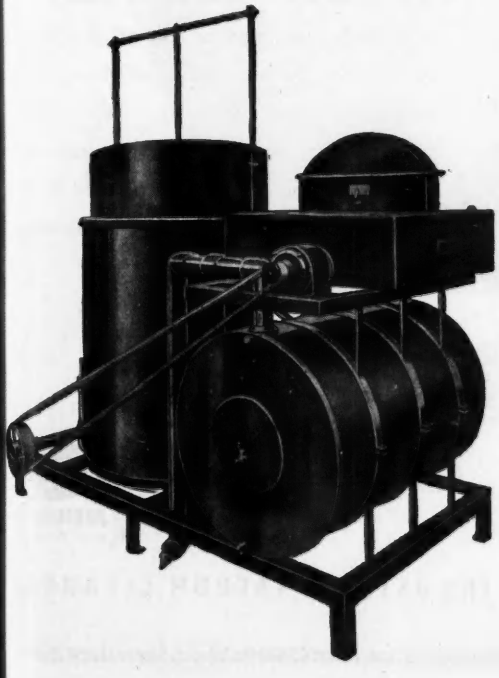

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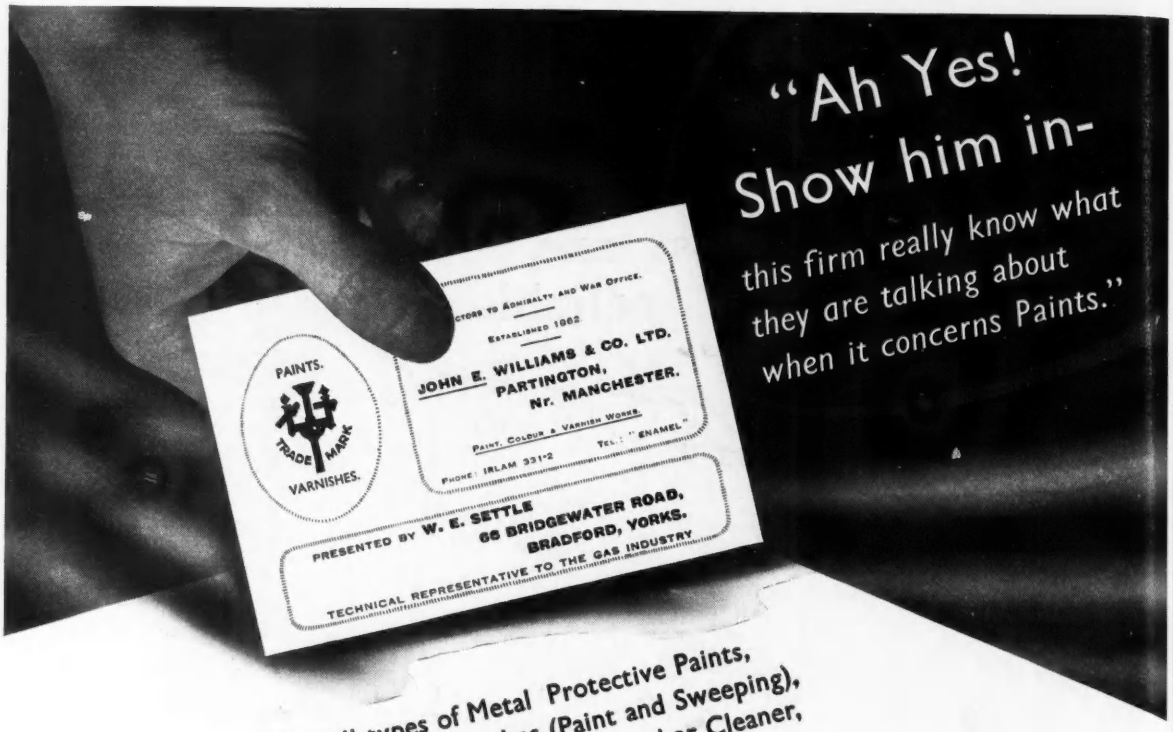

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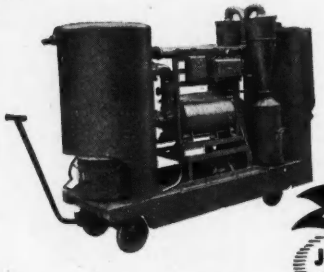

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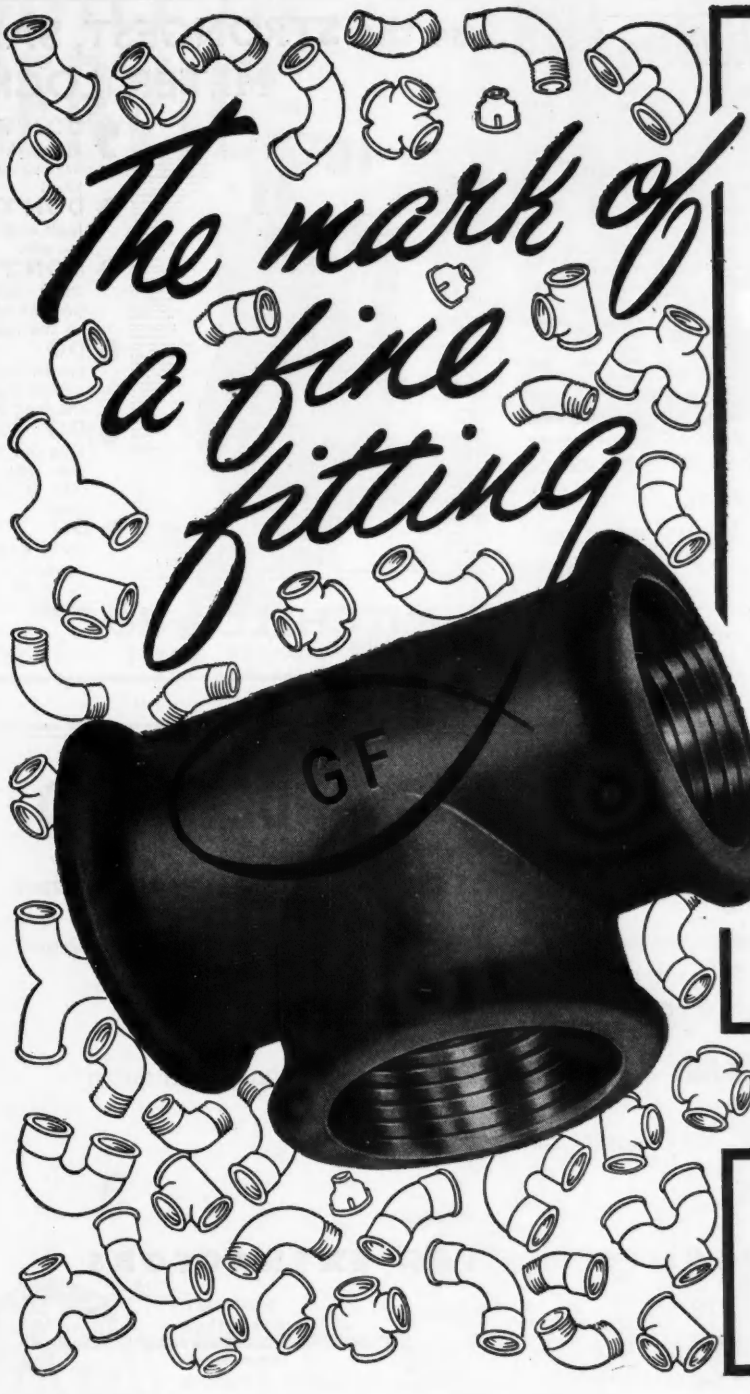

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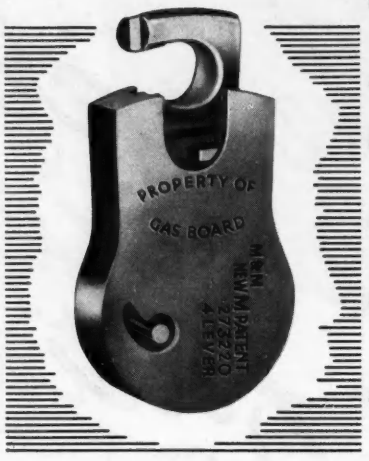

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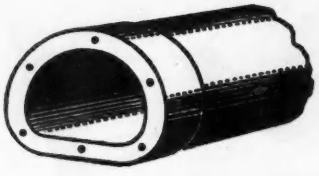

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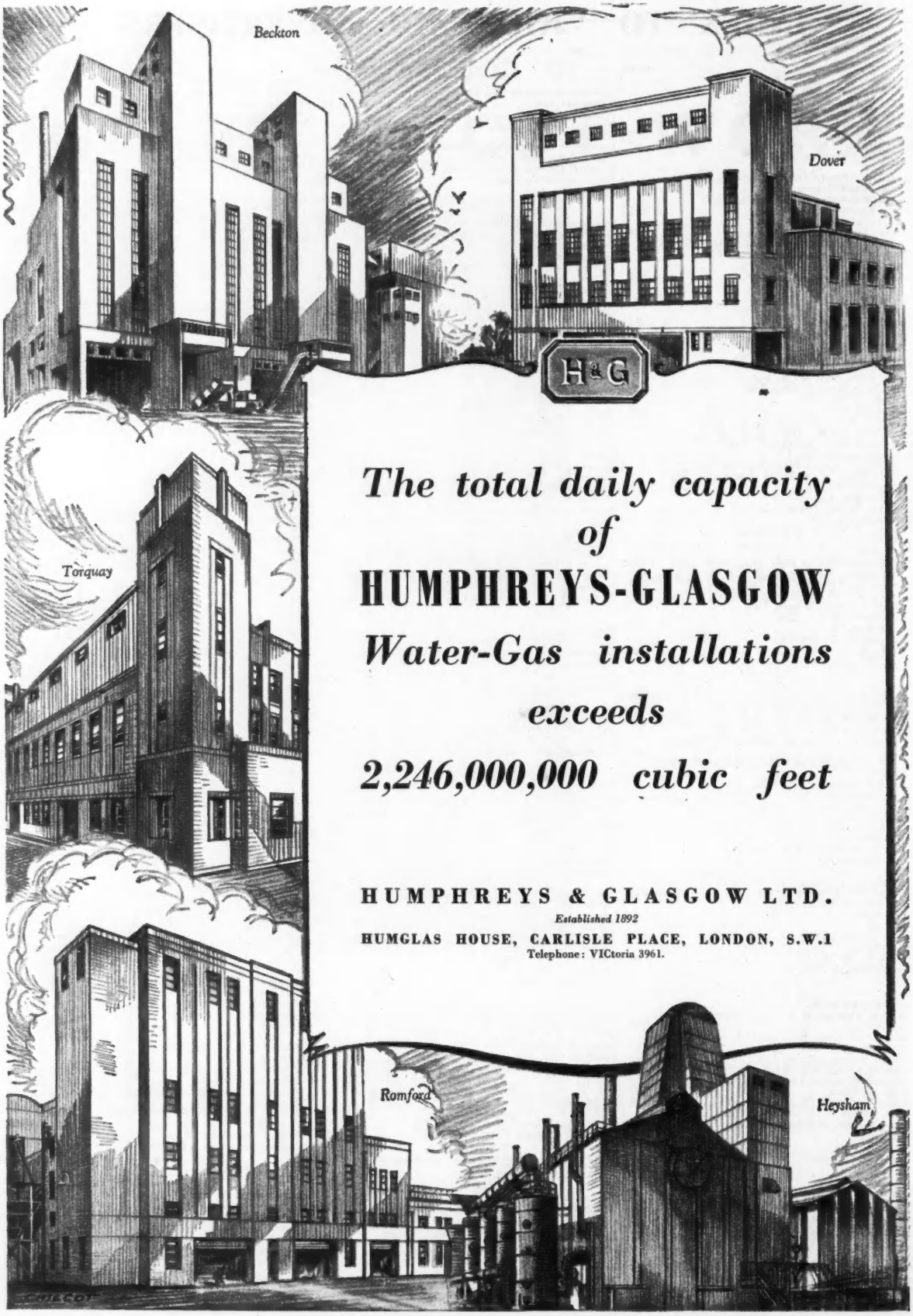

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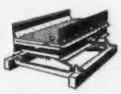

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Gas Journal

103rd YEAR OF PUBLICATION

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GAS JOURNAL

VOL. 268. NO. 4611 103RD YEAR OCTOBER 17, 1951

THE FUEL PERIL

'WE have to address ourselves to the problem of how we can get through the coming winter without dislocation of our national life—how we are to avoid a shortage of domestic fuel and the curtailment of industrial production.' Thus the then Minister of Fuel and Power in opening a national conference convened by the Fuel Efficiency Committee of the Ministry in October of 1946—just five years ago. Last week, with the blessing of the Ministry, the Combustion Engineering Association staged a two-day conference to discuss the fuel and power shortage confronting us spectre-like on the eve of the winter of 1951-2. The conference was one of more than ordinary importance, it was conspicuously well attended throughout and addressed by those who could speak with the highest authority, and it was significant that the Minister of Fuel and Power should attend, speak at length, and 'stay the course' of the opening session in spite of the General Election looming immediately ahead. The 1946 conference was subdued and markedly technical; the present conference was frank and outspoken, vigorous and to the point, and unafraid in comment on the more vulnerable spots in the armoury of the separate industries comprising fuel winning, fuel losing, fuel treatment, and fuel utilisation.

Last week's conference in London—to the proceedings at which we devote many pages of this issue of the *Journal*—brought, as never before, the limelight to bear on the situation as it stands today and on how it may well develop unless there is a better understanding of the problems involved and, above all, a firm and cohesive policy, both long term and short term, on the best all-round use of coal. This will be obvious from the resumé of the conference which we publish today. But the question will at once arise, What progress, if any, have we made since the talkie-talkie of 1946? The conference clarified the position, recommendations were positive and had more drive, but the situation, far from having improved, has become worse and is of the gravest concern; and once again we are in danger of dallying with palliatives and shunning cures. The prospect is alarming. Our report—the whole of which has direct bearing on the gas industry—provides sufficient evidence of this.

We will examine briefly what we consider were the highlights of the 1951 conference. Certainly the discussions were not conducted with muted strings. Mr. Philip Noel-Baker, the Minister at the moment, a precarious moment, sensing opinion said at the outset that the tempo of the National Coal Board must be speeded up. Time and again during the meeting it was contended that the target figure for coal is woefully short of needs now and in the immediate future; and at the conclusion a recommendation was adopted to the effect that a more practical target figure should be given and the possibilities of achieving it set out. The N.C.B. target was described as 'grossly inadequate,' and it was bluntly asked why a higher, a much higher, target figure should cause the nation to shiver in its timbers. Even with the present target the optimism of the N.C.B. Chairman, who also spoke at length at the conference, was queried. Sir Hubert Houldsworth, however, presented a picture clearer than any we have yet had put before us, and in his remarks his scientific background and his long and intimate knowledge of the coal industry's especial problems were evident. We have no wish to over-garnish this note with figures, but certain of the figures given at the conference were illuminating. Sir Hubert looks in the main to industry in the matter of immediate coal saving. In 1938, 50 mill. tons of coal was used domestically; in 1950, 37 mill. tons. In 1938 the coal for the gas and coke used for the domestic consumer was about 9 mill. tons. In 1950 it was 16 mill. tons. The corresponding figures for electricity are 4 mill. and 9 mill. tons respectively. On these figures, 1 mill. tons less was being used for domestic purposes

in 1950 than in 1938; and having regard to the increase in population this means that in 1938 the consumption per head was 1.36 tons, compared with 1.26 tons now. And today few domestic consumers would consider themselves as being satisfactorily supplied.

The conference discussed fuel saving from two aspects —the short term and the long term. Several speakers, including the Minister of Fuel and Power, gave examples of how immediate fuel savings could be effected in industry by simple means and the exercise of commonsense. The ways and means—and opinions—are recorded in our report on later pages, as also are the cogent arguments advanced for increasing coal exports. And at the same time we heard about the diminishing stocks of coal—about how we are 'living on our fat,' and have been so existing for some years. In April, 1949, we ended up with about 10½ mill. tons of coal in stock. We may end up in next April with 7 mill. tons, with luck. We have struggled through at the expense of exports *and* at the expense of something like 3½ mill. tons reduction in end-of-winter stocks during recent years. It is all very gloomy. And still considering the short term policy, we were not surprised to find at the conference many industrialists who asked why the Government, if it was out to encourage saving of coal in industry, would not allow incentives, by way of tax concessions for those who spent money in actually saving this coal. As a result of the heavy burden of taxation and the general rise in price levels industry is faced with grave problems in financing the maintenance of operations. The question of incentive, as was stressed by Sir Archibald Forbes, President of the Federation of British Industries, and by other speakers, is therefore of importance. On this matter of tax incentive the Minister was noncommittal.

CALAMITOUS POLICY

DISCUSSION on the longer term policy for fuel took casually in its stride underground gasification, the harnessing of the wind and the tides, the use of methane. But the battle was mainly pitched on the shortcomings of the British Electricity Authority in failing to encourage the installation by industry of back pressure turbines and the interlinking of surplus power with the grid, and its prodigality and carelessness in building-up a heating load for which electricity is not fitted and which imposes unnecessary hardship on industry and gross waste of capital, coal, and industrial productivity. The electricity and the gas industry had their protagonists in the Chairman of the Eastern Electricity Board (Mr. C. T. Melling, who is also present Chairman of the Electrical Development Association) and the Deputy Chairman of the Eastern Gas Board (Mr. J. H. Dyde, President of the Institution of Gas Engineers). Their arguments are set out side by side on later pages. Mr. Melling demanded A1 priority for capital expenditure on generating and distributing plant. Mr. Dyde put in a reasoned plea for the use of gas and solid fuel for heating purposes (cooking, space heating, water heating) in the interests of coal conservation and consumer economy. We think it was generally agreed at the conference that in this conflict of words gas won handsomely.

It is commonplace that the supply of electricity falls very much short of industrial demand and that industrial life and progress depends very largely on electricity supply. The output of electricity has doubled since 1938, but the gap between supply and demand has widened, and it is doubtful if it will be narrowed for many years to come. This is a world-wide problem. In the United States output has trebled in the past 20 years; it will probably treble in another 20 years; it has been stated that supply will never catch up with demand. Norway, with hydro-electric power, uses more electricity per head of population than any other country. Supplies have increased 'according to plan.' Last winter there were power cuts in Norway every day. All this points to the urgency of using electricity to the best advantage; and at the conference its haphazard use for domestic heating was described in many terms, among which were 'calamitous' and 'fantastic.' Even a comparatively few days before the Election the Minister of Fuel and Power was forthright in asserting that the electric fire is really a danger to the electricity industry itself; the electric fire 'is beyond question a major cause of power cuts.' Mr. B. E. A. Vigers, Chairman of Laporte Chemicals, begged industrialists to cast out from their works and offices and canteens all electric radiators and water heaters and cookers and replace them with apparatus more efficient thermally. 'If you do not,' he declared, 'how can you expect success for a campaign to reduce the domestic heating peak load in order to leave essential power available to the industries by which we all live?' 'Why,' asked Sir John Charrington, 'is nothing being done in face of such clear facts?

ACCENT ON CLEAR THINKING

AT the final session of the conference Sir Ewart Smith, in an address on 'The Requirements for a National Fuel Policy,' pointed to the direct and significant influence of the power problem on the coal and the engineering industries. In the current year expenditure on electricity was £130 mill., which in fact represented something like a quarter of a million 'rolled-up' manpower in the erection of extra generating stations. The while, electricity was being degraded in the supply of heat domestically. We have not sprinkled this note on the conference with many figures—and figures abounded. But we would mention the following in Sir Ewart Smith's plea for 'bold action.' His contention was simple enough. It costs £100 per kWh in generating and distributing plant. A modern council house, all electric, has a capacity of 12 kW—on a conservative estimate, 7 kW. Allow for the diversity of demand and bring the peak capacity down to 5 or 4, or even 3 kW. To the number of new houses (200,000) add conversions of existing houses, hotels, and so on (100,000). There is no need to take away the 'number you first thought of' to appreciate what this means at times of peak load when industry is crying out for power.

Mr. Oliver Lyle, who enlivened the meeting in all its stages with pungent and stringent criticism, spoke on

long term policy. There was going to be no rosy dawn, he said, no golden sunrise, in the next 10 years. We were promised 30 mill. additional tons of coal. The B.E.A. would need it all! In regard to interlinkage, the Authority was going blissfully along with its head in the clouds and its feet in the mud.

Obviously the electricity industry must have sweated in the heat of the fray. The gas industry, too, had something to think about, particularly in the comments of Mr. W. L. Boon in his 'summing-up.' For many years Mr. Boon was largely responsible for the co-ordination of the coke market, and his efforts met with success. He now sees an undermining of the gas coke market and a tendency for the gas industry to swerve away from what he firmly believes is its proper function—a two-fuel industry, a purveyor of gas and solid smokeless fuel. Gas and coke are complementary. Mr. Boon's contention is that the gas industry, wherever it is hard pressed, increases the gas supply by gasification of coke, thereby denuding the coke market. The domestic field, being thus denuded of solid fuel, turns more and more to gas and electricity, and the thousands of householders who in past years have been encouraged to install coke burning appliances are having a raw deal. Again on the question of co-ordination, Mr. Boon asked what measure exists in the two nationalised industries, gas and electricity—each supposed to be working in the national and not just the sectional interest. And coming specifically to the electricity industry he called for a resolution from the conference that steps should be taken to ensure that the use of electricity for heating should not be encouraged in the present heedless fashion.

Opinion from all sides was usefully put forward at the conference. There was no beating about the bush. What next? Are we, five years hence, to record that the C.E.A. conference of 1951 met with the same fate as the Ministry of Fuel and Power's conference of 1946 —to record, in effect, that such performances are but skilful expositions of political, economic, scientific, and technical prowess and counter-prowess ?

THE GAS OFFICERS' GUILD

THE constitution of the new Senior Gas Officers' Joint Council, whose first meeting we reported briefly (too briefly, though by no fault of ours) in our issue of July 4, is significant. It includes on the employees' side, ten members of the Gas Officers' Guild and five from Nalgo and, on the employers side, fifteen representatives of the Gas Council and the area boards. There is every reason, therefore, why the Guild should be strongly supported—much more strongly than we fear is at present the case.

When the movement was initiated which culminated in the formation of the Guild, the problem of terms and conditions of service were an aspect very different from that of the present day. Then it was easy to visualise a scale of salaries as one of the most important objects before the Guild. Then, too, the gas engineer was generally the chief executive officer, responsible to an independent board of directors or local government authority for the conduct of a self-contained and readily defined gas undertaking. His standing could be roughly measured by the annual capacity of the undertaking. Now, the picture is very different. The gas engineer's duties are spread over a division or a district; he may be responsible for only one department of the organisation to which he is attached. The scale of salaries becomes either impossible or one which must be based on considerations much more difficult to define than those prior to nationalisation in 1949. It will probably be as distasteful to the gas officer himself as to the area boards to contemplate such a 'grading' as can be seen, for instance, in several branches of the civil service.

There is thus plenty of important and delicate work before the new Joint Council. The influence of the Guild will be proportionate to its strength as measured, first, by its membership and secondly, by the active interest taken by its members in the formulation and implementation of its policy. An aspect which needs to be taken into account in the scaling of salaries, for instance, is the difference of attitude with regard to salaries as between the senior gas officer and the next lower grade. In border line cases the officer may be only a little below his senior in salary—but he may be entitled to proportionately substantial extra remuneration for emergency work while his senior who may put in just as much time, sometimes more, is not so entitled. No one, least of all the senior gas officer, wishes for such considerations to influence his attention to duty, but such cases may be thought to call for a substantial difference in scale between the two grades.

Apart from terms of service narrowly conceived there are several questions which influence comfort and contentment in service. There is the question of housing. Very considerable hardship may be suffered by a gas officer seeking to better himself by accepting service in a new district by the expense to which he may be put in the purchase of a house. We gather that some area boards are endeavouring to relieve him of actual capital expenditure when moving in this way. But there remains a drain on his salary for interest on and repayment of loans which should be (and we hope, is) taken into account when fixing his salary. The question is tied up with the whole problem of the immobility of population arising out of the shortage of housing and by the inordinate cost of houses in certain towns and districts. It will not be easy of solution. Can it be solved by the purchase or building of houses by the area boards to be rented by gas officers?

Emoluments in kind will, rightly, become a thing of the past, but should attract adequate compensation. Car allowance, however, in some form will remain a necessity. Recent adjustments have amounted in some cases to a reduction, by no means negligible, in gross emoluments. A satisfactory generally applicable scheme will not be evolved without careful enquiry and negotiation in which the Guild should play its full part.

It will not be found in a rigid formula because the circumstances vary so considerably, but the allowance should continue to be a realistic one.

There are expenses legitimately incurred in attendance, which should be encouraged in every way, at meetings of the Institution, parent body and district sections, and of other technical and scientific bodies. The formula 'reasonable expenses' may be distasteful to the conscientious man and a red rag to an overconscientious tax inspector. Railway fares plus a fixed sum per day might be better but in these days of fluctuating, and generally rising, costs, the latter would need annual revision.

But the Guild should take an effective interest in matters not directly affecting terms and conditions of service. The gas officer is as interested as anyone in the recruitment of the industry in its senior ranks. This begins with the student and with the education scheme, quite apart from salaries, which generally are inadequate and unattractive. Naturally education is looked after by the education officer of the board, where such an official is appointed, for we must remember there are considerable differences in organisation and staffing in the areas. Facilities and financial support must be forthcoming for young men seeking to secure tuition in technical colleges away from home. In the extreme case there are scholarship holders who cannot go to Leeds or Sheffield without substantial maintenance grants. The Guild should interest itself in these cases and keep the Joint Council informed of instances which come within the knowledge of individual members. It is a significant mark of health and contentment in an industry when son seeks to follow father in its service. This pleasant feature of the gas industry, almost as important as the influx of new blood, is more likely to be continued if senior officers are able to influence training and education by way of the Guild and the Joint Council.

It is clearly the intention of the Act that everything affecting the terms and conditions of service of senior gas officers, as with all other grades, should be openly and freely discussed between the Council and the 'appropriate organisation.' The Guild has now been recognised as an 'appropriate organisation' of senior gas officers. There is no excuse whatever for any 'Senior Gas Officer' to withhold his support from the Guild whether by passive membership or by active participation in the formulation of policy.

If the Guild should now fail or be weakened by lack of such support any future grievances of the senior gas officer are more likely to be treated with contempt than with sympathy. He must remember, too, that the highest appointments in the gas industry are for a term of five years and cannot in the present set-up be entirely free of political bias; that what may be a comfortable billet now may be disturbed during some future regime. Cohesion and strong representation are good insurance policies for all, from the highest to the lowest officer.

Letter to the Editor

SULPHUR FROM THE GAS INDUSTRY

DEAR SIR,—We noted with interest in your September 5 issue the extract from the article 'Sulphur from the Gas Industry,' by Dr. J. G. King. In his article, Dr. King mentions a method for the removal of H_2S from gas by employing true counter-flow movement of the gas and oxide. This reference leads us to inform you that we have now concluded licence arrangements with Messrs. Gastechnik G.m.b.H., Oberhausen (Rhld.), and will shortly be in a position to deal with specific enquiries for the continuous and complete removal of H_2S from gas, fulfilling, in our opinion, Dr. J. G. King's ideal, and incorporating the production of sulphur with the re-use of the oxide material.

The oxide, which is in pelletted form, will flow down cylindrical towers and be worked up to a sulphur content of 30%, although no air is admitted with the gas for revivification in situ.

Sulphur is recovered from the oxide by treatment with a non-inflammable organic liquid, the resulting sulphur being 96% pure. Desulphurised pellets are re-used in the towers.

It is to be emphasised that this plant is not in the development stage, as indeed there are some 54 installations in operation on the Continent.

The principal advantages claimed for the plant are: low capital cost, small ground space, flexibility of operation, low back-pressure, re-use of the oxide, steady labour requirements, continuous operation, and the production of sulphur for sale.

After close examination of the technical aspects and economics of the process, we are satisfied that it solves many of the problems concerned with the removal of H_2S to statutory limits and the production of sulphur for industry.

We hope shortly to publish a detailed description of the process.

Yours faithfully,
FOR ROBERT DEMPSTER & SONS, LTD.,
B. C. MORTON,
Managing Director.

Rose Mount Iron Works,
Elland, Yorks.
October 12, 1951.

Obituary

Mr. R. Vevers Scott, Engineer of the Canterbury Gas and Water Company from 1933 until the nationalisation of the gas industry in 1949, and latterly Manager of the Canterbury undertaking in the East Kent group of the South Eastern Gas Board, died at his home at Canterbury on October 10, aged 59.

Personal

Mr. Ralph Credland, Assistant Managing Director for the past four years, was appointed Joint Managing Director at the annual general meeting of the Widnes Foundry & Engineering Co., Ltd.

◆ ◆ ◆

Mr. E. J. Wilson, until recently Assistant Engineer to the Port of London Authority, has been appointed London Office Manager for Richard Sutcliffe, Ltd., of Wakefield, at 235, Vauxhall Bridge Road, London, S.W.1 (telephone Victoria 0844).

◆ ◆ ◆

Mr. G. F. Jeynes, Commercial Manager of Monitor Engineering & Oil Appliances, Ltd., has been appointed a Director of that Company with the title of Sales Manager. Mr. Jeynes has been associated with both the Parkinson Stove Co., Ltd., and Monitor Engineering & Oil Appliances, Ltd., for the past 20 years.

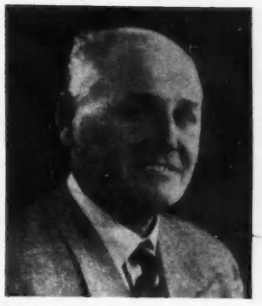
Mr. L. A. Garratt, Organising Officer, Gas Staffs, National Association of Local Government Officers, has been appointed Industrial Relations Officer to the Northern Gas Board and will take up his new duties on November 1. Mr. Garratt undertook his present position on the nationalisation of the gas industry in 1949, having previously been on the staff of the Hinckley Urban District Council Gas Department for 22 years, attaining the position of chief clerk and accountant. He is a member of the National Joint Council for Gas Staffs and until he relinquishes his post with Nalgo he will remain Staff Side Secretary. He is also a member of the Senior Gas Officers' Joint Council.

◆ ◆ ◆

Mr. R. J. Smith, Director and General Manager of the National Benzole Co., Ltd., retired from the service of the Company on September 30 owing to ill health. The Directors have appointed **Mr. H. H. Bates,** a member of the Executive Committee, Managing Director as from October 1. Mr. Bates, who is 52, was educated at King Edward VII School, Sheffield, and New College, Oxford—where he gained a First Class Honours Degree in Chemistry—and served in the Special Brigade of the Royal Engineers during the first world war. He joined the staff of Burt, Boulton & Haywood, Ltd., at Silvertown in 1923, and after serving their interests in France, became Commercial Manager of their Paris office in 1925. In 1935 he took up an appointment with the South Western Tar Distilleries, for whom he has been General Manager since 1941. Mr. Bates is a Director of the National Benzole Association and Burts & Harvey, Ltd., of Totton, and has been a member of the Board of the National Benzole Co., Ltd., since 1946.

Mr. H. H. Bates

Mr. Thomas Thomson will from November 1 succeed Mr. W. P. Rae as Scottish Representative of Alder & Mackay, Ltd. Mr. Thomson is well known to the Scottish gas industry, having been connected for 25 years, apart from war service, with the coal supply side in representing Gillon, Brown & Co., Ltd.



Mr. W. P. Rae

Mr. T. Thomson

Mr. W. P. Rae has been appointed Northern Sales Manager to R. & A. Main, Ltd. Aberdeenshire born, and educated at Dundee High School, Mr. Rae held a commission in the Royal Artillery in the 1914-18 war and served in France and India. After demobilisation he spent some years in New Zealand, returning to this country in 1930 and joining Electrolux, Ltd., on the refrigeration side, as Sales Manager in Scotland. In 1939 he joined Alder & Mackay, Ltd., as Scottish Representative, later becoming Sales Manager for Scotland, which position he now resigns. A keen golfer, Mr. Rae is a member of Troon and Glasgow Golf Clubs, and is Honorary Secretary and Treasurer of the Scottish Association of Gas Managers' Golf Circle. He will commence his duties with R. & A. Main, Ltd., on November 19, and will operate from Gothic Works, Falkirk.

Diary

A number of meetings arranged for next week have been postponed on account of the General Election. The new date of the meeting of the Manchester and District Section of the Institution of Gas Engineers has not been fixed, but it is expected to be in the latter part of November.

Oct. 18.—Institute of Fuel (East Midlands Section): Film Evening. Gas Showrooms, Nottingham, 6.15 p.m.

Oct. 18.—Institute of Fuel (Midland Section) and Institution of Heating and Ventilating Engineers: Joint Meeting. 'The Pimlico District Heating Scheme,' A. E. Margolis. Imperial Hotel, Temple Street, Birmingham, 6.30 p.m.

Oct. 19.—Scottish Junior Gas Association (Western District): 'Industrial Relations,' C. Murdoch, J.P. (Scottish Gas Board). Royal Technical College, Glasgow.

Oct. 23-26.—Dairy Show, Olympia. Gas Council exhibit.

Oct. 20.—Manchester District Junior Association of Gas Engineers: President's Day, Gaumont Ballroom, Morecambe, 2.30 p.m.

Oct. 20.—Manchester District Junior Association of Gas Engineers: Annual General Meeting, Presidential Address by L. G. Townsend. Morecambe, 2.30 p.m.

Oct. 23.—Chemical Engineering Group (Society of Chemical Industry): 'Some Sulphur Recovery Processes in Refining Operations,' G. M. Rowell. Geological Society Apartments, Burlington House, Piccadilly, 5.30 p.m.

Oct. 23.—Midland Junior Gas Association: 'The Use of Producer Gas for Peak Load Outputs,' D. J. Ward, Birmingham. Staff Mess Room, West Midlands Gas Board, Birmingham.

Oct. 26.—Institution of Gas Engineers (Midland Section): Autumn Meeting. 'The Development and Administration of a Small Group of Undertakings,' E. B. Craddock (Aylesbury). Queen's Hotel, Birmingham, 2.30 p.m.

Oct. 27.—London and Southern Junior Gas Association: Visit to South Eastern Gas Board's Waddon Works, Croydon, 2.30 p.m.

Oct. 30.—Institution of Gas Engineers (London and Southern Section): Annual General Meeting, 17, Grosvenor Crescent, S.W.1, 2.30 p.m.

Oct. 30.—Society of Instrument Technology: Presidential Address, 'Development of Materials for Instrument Manufacture,' E. B. Ross. Royal Society of Tropical Medicine and Hygiene, Portland Place, 7 p.m.

Oct. 31.—Institution of Gas Engineers (Eastern Section): 'References and Experiences Relative to Gasworks Foundations,' A. G. Bird, M.I.MECH.E., M.INST.GAS E. 17, Grosvenor Crescent, S.W.1, 2.30 p.m.

Nov. 1—North Thames Gas Consultative Council: Westminster City Hall, Charing Cross Road, 2.30 p.m.

Nov. 1.—Midland Junior Gas Association: Half day visit to works of Sperryn & Co., Birmingham.

Nov. 1.—Scottish Junior Gas Association (Western District): Evening visit to Colvilles, Ltd., Clydebridge, Glasgow.

Nov. 2.—London and Southern Junior Gas Association: Short Paper Evening, Edgware Road, 6.30 p.m.

Nov. 3.—Scottish Junior Gas Association (Western District): Smoking Concert, Glasgow.

Nov. 5.—Women's Gas Federation: Executive Committee, Gas Industry House, 1 p.m.

Constructing a . . .

GAS MAIN UNDER RIVER NEATH

Unique Operation in South Wales

REFUSING to allow their interest to be curbed by even the precision of time and tide, about 20 gas engineers and managers watched, at six o'clock in the morning on October 9, final preparations for the laying of a gas main under the river at Neath (Glam.). On the previous day the 8½ tons prefabricated pipe was floated on high tide to a safe distance downstream. Then at low tide on the Tuesday morning about 120 detonators were set off on the river bed to make a channel for the pipe. One aspect that had to be taken into account was the nature of this particular river bed. On one side lies soft earth while on the other are rocks. After the explosion the bed was fairly level.

Among those who watched operations were Messrs. E. M. Edwards, full-time Member, Wales Gas Board; Ernest Ablett, O.B.E., Engineer, Manager, and Secretary, Swansea undertaking; W. T. Hird, Distribution Engineer, Wales Gas Board; J. H. Chapman, Assistant Planning Officer, Wales Gas Board; W. A. B. Porter, Distribution Engineer, North Western Gas Board; F. Bell, Liverpool group Distribution Engineer; John Powdrill, General Manager and Engineer, Pontypool (Mon.); G. Fitton, Engineer and Manager, Neath; R. J. K. Shepherd, Distribution Superintendent, Neath; Emlyn Jones, Engineer and Manager, Rhondda; D. E. West, Merthyr; A. D. Mason, Assistant Distribution Engineer, Wales Gas Board; W. D. Rees, Port Talbot; C. G. Reeves, Wales Gas Board; A. J. Cunnifee, Swansea; R. West, Swansea; J. H. Nutton, Swansea group Distribution Officer; and R. Kinsey, Deputy Manager, Swansea.

Mr. E. Johnson, Managing Director of the United Kingdom Construction and Engineering Co., Ltd., and Mr. J. G. Davis, Contracts Manager, were also present.

The engineers merged into informal discussions not over the normal luncheon or dinner table, but rather the breakfast table, breakfast arrangements being made by the Swansea group's home service officers.

Extending the Grid

The Neath operation, which is being carried out under contract for the Wales Gas Board by the United Kingdom Construction and Engineering Co., Ltd., Liverpool, forms part of a further extension of the West Wales Grid, originally recommended in a report submitted in March, 1948, to the Ministry of Fuel and Power by a small working party of local gas engineers, based on supplies of coke oven gas from the Abbey Works, Margam, Port Talbot, of the Steel Company of Wales. A substantial part of the grid has been completed and for some time past coke oven gas has been supplied to Porthcawl, Bridgend, Maesteg, Glyncorrwg, Port Talbot, Neath, and Pontardawe. The latest operation, which will extend the grid to the Morriston works of the Swansea undertaking, consisted of the laying of an 18 in. diameter steel main with a minimum cover of 5 ft. in the bed of the river Neath.

In view of the fact that the river is tidal with a depth of water ranging up to 19 ft. at high spring tides much consideration was given to the method to be adopted for the preparation of the trench in the river bed. The use of a grabbing crane was not considered feasible as the ebb and flow of the tide would fill in the trench more quickly than the pipe could be laid and jointed. Drag-lining a trench by means of excavators mounted on the river banks was considered impracticable owing to the width of the river, approximately 400 ft. from bank to bank. The conventional method of constructing a coffer-dam of inter-locking sheet or timber piles across the river in sections so as to afford protection from river water while each portion of the trench was excavated and pipe laid and jointed, was regarded as too lengthy and costly a procedure, particularly in view of the current steel shortage.

Instantaneous Action

The method finally adopted was a continuous line across the river bed of blast holes designed to blast out the whole trench at one time, and to produce a trench of the required depth from bank to bank *instantaneously*, so that the main could be laid across the full width of the river before tidal influences resulted in the trench being filled up again. An essential feature of the method was to have the whole length of steel main prefabricated on suitable supports on the river bank, in readiness to be floated into position immediately the trench was blasted out. Upward-pointing legs at each end of this prefabricated pipe were provided to ensure that completion of the main on both sides of the river could take place in normal working hours, between tides, and without any other special methods being necessary.

A trial blast was made in June, 1951, of eight charges (from 5 to 7½ lb. each) of submarine blasting gelatine in 2 in. cartridges, sunk 7 ft. into the bed of the river, and fired simultaneously by Cordtex at low tide, when there was no water over the site of the trial blast holes.

A hole was blown approximately 34 ft. by 15 ft. at the top, with sides at approximately 45° and a maximum depth of 8 ft. 6 in. The ends of the trench fell in quite rapidly, but the sides held fairly well. Water ran into the hole from the surface and through the gravel bed. This flow ceased when the depth of water was about 3 ft.

The debris mainly appeared to be thrown vertically and reached a height of 100-150 ft. The maximum throw was approximately 100 yd.—this was small pebbles with an occasional stone of up to 12 in. in size.

The trial blast showed that the method of excavating the trench would be satisfactory, but to offset the reduction in depth due to some slip from the sides of the trench, and to silting during the tide before the pipe was positioned, it was decided to drive the charging tubes (4 in. diameter cast iron tubes with steel toes and hardwood caps) to a depth of 9 ft. below the bed of the river to ensure a minimum cover of 5 ft. for the main.

It was also decided, to ensure sufficient width at the bottom of the trench, that charges should be staggered—*i.e.*, placed in two lines 2 ft. apart with 4 ft. 6 in. between adjacent pipes in the same line.

The amount of charges recommended by I.C.I. (Explosives Division) was 10 lb. per tube (2½ in. dia. cartridge of 2½ lb.). The charges were placed in position as blast holes were formed, ready for firing later. The Cordtex fuse is not affected by immersion in water.

Exact Timing

No great physical dangers were involved because the river crossing is reasonably remote from buildings and highways; considerable care was, however, needed in planning and timing the various operations, and in setting up sight rails and checking points, to ensure that when the main was sunk into position it would be evenly bedded throughout its length, and would have a regular fall across the river to the syphon point.

The horizontal length of main (approximately 232 ft.) together with the inclined legs on both sides was laid and jointed on timber chairs on the Swansea side of the river, upstream of the proposed line across the river. It was placed with the underside of the pipes at a level of about 8 ft. O.D. so as to allow sufficient depth of water to float the pipe on various heights of tide.

To avoid heavy costs of temporary supports sufficient to prevent premature flotation, the ends of the pipe were left open during fabrication. Before floating, mops impregnated with oil or bitumen were drawn through the pipe to clean it, and to coat the inner surface, and cap ends were then fitted.

A draw-wire was left in the main for the purpose of pulling test-mops through again, after having been laid in position. After completion of fabrication and before floating, the pipe was tested at 100 lb. per sq. in. air pressure.

Certain of the weldings of the prefabricated pipe were subjected to ultrasonic testing, a method of testing metal sheets/pipes/welds by 'sound-waves.' The testing was carried out by placing

two Perspex probes on the metal near the area to be tested; one probe acted as a transmitter and the other as a receiver. Any fault in the grain of the metal would be shown on a screen not unlike a television screen and the position of such fault could be accurately scaled from the screen to a position in the sheet/pipe/weld. This method is similar to that of 'Asdic' used for locating submerged vessels—*e.g.*, submarines, wrecks, etc.

At high tide about noon on October 8, the prefabricated pipe was floated from its supports and moored at a safe position downstream. Two small motor boats were available to assist in handling the pipe and for other duties.

At low tide on October 9—*i.e.*, about 6 a.m., the charges were detonated and immediately afterwards the trench was inspected to see that it was clear of obstructions. The pipe was then floated up into position over the trench on the incoming tide and was manipulated by means of six winches, three mounted on each bank in suitable positions. The blank cap on the upturned leg of the main on the Neath side had been fitted with a hand-operated air valve and the one on the Swansea side with a valve to admit water for sinking the pipe. The water was pumped into the pipe through suitable strainers to prevent ingress of foreign bodies.

The main length of pipe had a fall of 1 in 50, to a syphon of the blister type on the Neath side, where the level of the underside of the pipe was 11.34 ft. O.D. The leg on the Neath side rose at a grade of 1 in 2 and that on the Skewen side at a grade of 1 in 6.

The stipulated fall towards the syphon was checked by passing a travelling boning rod along the top of the pipe and irregularities were dealt with by high pressure water-jetting along the sides of the pipe once it was in its approximate position.

As soon as the pipe was in its final position, a low pressure hydraulic test was applied for a period of two hours, and this test proving satisfactory, backfilling was commenced by depositing a weak concrete mix over the pipe at intervals, through a tremie pipe to prevent separation of the cement as the concrete fell to the bottom of the trench.

Scientists to Industry

RECENTLY, we had the pleasure of visiting the research laboratories of Nash & Thompson, Ltd., at Oakcroft Road, Tolworth, Surrey. The firm was founded in 1936 and for the first nine years its efforts were concentrated on designing and developing the well-known Frazer-Nash gun turret and also on developing many types of Radar scanner. In 1945 it assumed responsibility for research into problems associated with the design and development of a wide range of products, and its activities have developed continually since then. At the present time the facilities and accumulated experience of the Company are available for industry in general. In addition to its extensive and well-equipped laboratories the firm has a very highly-qualified staff of physicists, chemists, and engineers and is in a position to handle scientific and industrial problems of all kinds. Nash & Thompson, Ltd., have developed a standard range of specialised scientific apparatus and this is constantly being extended. They are also prepared to design and manufacture single instruments to suit users' special needs, and to produce such instruments in small numbers if required. The Company is also prepared to investigate and advise on scientific and industrial problems such as corrosion, electro-plating, paint finishes, chemical and metallurgical analysis, colour matching and electronics.

One standard instrument of particular interest to gas engineers is the aeration test burner. This has been described in the *Journal* on a number of occasions, but a further brief reference will not be out of place.

Fundamentally, the aeration test burner consists of a carefully standardised bunsen burner with a calibrated air port of variable aperture. The aperture can be opened or shut until the inner cone of the flame reaches a standard height and the setting of the aperture shutter as read on a scale (the A.T.B. number) is then a reading of the flame-forming properties of the gas.

In order that the reading shall be significant and reproducible it is essential that the conditions under which combustion takes place should be carefully controlled. To this end a pressure governor is incorporated in the instrument. A sheet of plate glass screens the flame from draughts and a water jacket round the burner tube prevents transfer of heat from the flame to the shutter assembly. A pressure gauge is also provided so that any failure of the governor is immediately apparent. The flame height is adjusted by viewing the flame and its reflection in a mirror which bears an engraved line at the correct level.

The A.T.B. was designed at Watson House, the research centre of the (then) Gas Light and Coke Company. Each burner is calibrated against a standard instrument which has, in turn, been calibrated against a master instrument held at Watson House.

Fitters from Ireland

More than 70 members of the Dublin Gas Company Fitters' Social Club visited the works of Main Water Heaters, Ltd., at Croydon. They were divided into groups and conducted round the works. After the luncheon at the Aerodrome Hotel, Mr. G. F. Jenkins (Sales Manager) welcomed the guests and spoke of the strong ties and place of their esteem with the Dublin Gas Company. Mr. Jenkins mentioned that he was deputising for Mr. F. W. Chapman (Manager) who was in Scotland. In conclusion, it was hoped that the visit would prove useful to the members and a service to the people of Dublin. Chief Inspector J. Leneham thanked Mr. Jenkins and Main Water Heaters, Ltd., for the excellent arrangements and said that the tour had been most useful. During the afternoon there was a discussion on water heaters which was introduced by Mr. Jenkins and Mr. J. Emberson (development and research department). Mr. J. C. Thomas and Mr. J. M. Andrews answered the questions.

The 'Big Five' seated in the centre of this group, photographed after the tour of the works, are E. Walsh (Secretary of the Dublin Gasfitters' Club), R. Barry (Chairman of the Club), G. F. Jenkins (Sales Manager, Main Water Heaters, Ltd.), E. Lenehan (Vice-President of the Club), and W. Cole (Ireland Representative for R. and A. Main, Ltd.).

Institution Examinations, 1951

THE following is an abstract of the Report of the Board of Examiners on the 1951 Examinations of the Institution of Gas Engineers. During 1950-51 the members of the Board and the Assessors were:—*Major Courses*—W. S. Hubbard, J. Castle, W. A. Evetts, S. K. Hawthorn, J. C. Hogg, E. T. Pickering, W. F. Thorne, F. R. Weston (Gas Engineering, Manufacture), E. W. B. Dunning, F. Bell, R. F. Hayman, W. T. Hird, W. J. Parsons, W. G. Phillips, C. D. Shann, J. F. Waight (Gas Engineering, Supply). Assessors:—Gas Engineering (Manufacture) and (Supply). West of Scotland: J. M. Dow (Paisley); W. M. Gledhill (Stirling). East of Scotland: D. Beavis (Edinburgh); W. C. Campbell (Galashiels).

The number of candidates who entered for the examination during 1951 was considerably smaller than in 1950, there being a decrease of nearly 25%. This decrease occurred in the Ordinary Grade examinations, the entries to both the Diploma and Higher Grade examinations showing increases. The standard of the answers submitted for the Diploma examinations showed a slight improvement over those of last year, but in the other examinations, with the exception of the Ordinary Grade examination in Gas Engineering (Manufacture) in which the results were comparable with those of last year, there was a marked deterioration.

The examiners were surprised at the number of candidates who failed to take notice of the instruction at the head of all the question papers, advising candidates to commence each question on a fresh page. This fact, considered in conjunction with the contents of some of the answers submitted, indicated that many candidates did not take sufficient trouble in reading the question paper before they began their answers.

'Disappointing'

The standard of answers was disappointing; again over 40% of the candidates failed the examination. The elementary engineering knowledge displayed left much to be desired and the poor English indicated that the general education of the candidates was below that required by a professional body.

The sketches, which have been so severely criticised in the past, reached a sufficient standard of draughtsmanship for the purpose, but many candidates omitted important details or offered sketches so badly out of scale as to leave doubt as to their knowledge of the plant.

Nearly all candidates submitted answers to six questions and there was little indication of shortage of time in completing the paper. There was, however, ample evidence of insufficient acquaintance with usual gasworks plant and with the fundamental principles of operation, which must be due, to some extent, to inadequate facilities for practical works experience. More attention must be paid to the training of candidates to present answers in a lucid form—this can best be done by teachers giving homework in the form of examination questions and correcting the presentation as well as the substance of the answers.

'Obvious Padding'

The results of this examination were most disappointing as, out of 158 candidates, there was none worthy of distinction, only four first class passes, 59 second class passes, and 95 failures. Although the number of candidates who entered for the examination was higher than last year, the results obtained were worse.

Sketching, spelling and English showed some improvement over last year.

Many candidates apparently failed to read the questions carefully before commencing their answers and frequently there was much obvious padding and the inclusion of material not demanded by the question. In questions where calculations were necessary, many candidates failed to check their answers and it was frequently difficult to follow their marginal workings.

The answers to several questions indicated a lack of knowledge of fundamental principles.

It is considered that Higher Grade candidates should have the ability to give more 'reasoned' answers and to present advantages and disadvantages of particular plants or processes in a clear and concise manner.

There were 17 candidates for the Diploma in Gas Engineering (Manufacture), of whom two re-entered only for the written examination.

Written Examination

Sixteen candidates entered for the written examination and, although more than half of them obtained at least 50% of the possible marks, the general standard was low, particularly in view of the high quality of some of the home papers. Evidence of the low general standard is provided by the fact that of the 127 questions answered, only seven earned 80% or more of the possible marks and a further 10 between 70 and 80%.

Candidates did not use the greatest opportunities for illustrating their answers by simple sketching and, where a sketch was specifically required it was of a very low standard.

COMPARATIVE SCHEDULE OF EXAMINATION CANDIDATES

Subject	Grade	1950 Internal	1950 External	1951 Internal	1951 External
Gas Engineering (Manufacture)	Ordinary	133	64	50	51
	Higher	92	34	103	55
	Diploma	—	7	—	17
Gas Engineering (Supply)	Ordinary	238	98	74	82
	Higher	72	32	95	56
	Diploma	—	7	—	5
Total		535	242	322	266
Grand Total		777		588	

ORDINARY GRADE GAS ENGINEERING (MANUFACTURE)

Class	Internal—50 No.	Internal—50 %	External—51 No.	External—51 %	Total—101 No.	Total—101 %
1st with Distinction ...	—	—	1	2.0	1	1.0
1st	5	10.0	7	13.7	12	11.9
2nd	26	52.0	20	39.2	46	45.5
Fail	19	38.0	23	45.1	42	41.6

The numbers of failures in the Higher Grade examinations in Gas Engineering (Manufacture) and Gas Engineering (Supply) amounted to 60% and 64% respectively. Since there has been no raising of the standard of marking, it can only be assumed that a large number of candidates, who had little prospect of passing, entered for the examinations.

A review of the results obtained by internal candidates prompts the examiners to question the quality of the teaching in some technical colleges and to express the hope that the facilities offered in connection with the Register of Teachers in Gas Subjects, recently initiated by the Institution, will bring about a marked improvement.

Once again no candidate, geographically eligible for the Herbert Lees Memorial Prize, obtained a first class pass in either the Higher Grade examination in Gas Engineering (Manufacture) or Gas Engineering (Supply) and the examiners were unable to recommend the award of the Prize in 1951.

HIGHER GRADE GAS ENGINEERING (MANUFACTURE)

Class	Internal—103 No.	Internal—103 %	External—55 No.	External—55 %	Total—158 No.	Total—158 %
1st with Distinction ...	—	—	—	—	—	—
1st	3	2.9	1	1.8	4	2.5
2nd	42	40.8	17	30.9	59	37.4
Fail	58	56.3	37	67.3	95	60.1

There were several questions where candidates could usefully have referred to some aspect of costing or economics, but they either failed to do so or they answered in such a way that they appeared to have only a hazy idea of this aspect of gas engineering. The examiners feel that at the Diploma stage candidates should have a very sensible appreciation of costing and economy.

The standard of grammar and prose in many cases was poor, having regard to the grade of the examination, and it is felt that candidates must pay more attention to this aspect in order to qualify for appointment to an administrative post.

In general, it seemed that the candidates were not sufficiently advanced in many cases to take the examination.

The results of this examination were disappointing, 50% of the candidates having failed. A general survey of the answers showed that most of the candidates who failed did so in each section of the paper, although the industrial section still appeared to have been the least understood. It was obvious that a number of candidates attempted the examination without due preparation, and the all-round standard of answers was far below that expected from candidates who, it was anticipated, would be above 18 years of age. From these and similar points, it is difficult to dissociate the question of whether teaching is always adequate.

The standard reached by most of the candidates in this examination was lower than in 1950 and, although the standard of presentation was somewhat better, it is still in need of improvement, particularly in calculations.

HIGHER GRADE GAS ENGINEERING (SUPPLY)

Class	Internal—95		External—56		Total—151	
	No.	%	No.	%	No.	%
1st with Distinction ...	—	—	—	—	—	—
1st	2	2.1	1	1.8	3	2.0
2nd	32	33.7	19	33.9	51	33.8
Fail	61	64.2	36	64.3	97	64.2

ORDINARY GRADE GAS ENGINEERING (SUPPLY)

Class	Internal—74		External—82		Total—156	
	No.	%	No.	%	No.	%
1st with Distinction ...	—	—	—	—	—	—
1st	9	12.2	18	22.0	27	17.3
2nd	28	37.8	22	26.8	50	32.1
Fail	37	50.0	42	51.2	79	50.6

Many candidates had clearly not reached the standard required for the Higher Grade examination, some answers being unbelievably bad, and it is considered that closer guidance on suitability for entry to the examination should be given by teachers.

There were five candidates for the Diploma in Gas Engineering (Supply), one of whom re-entered for the written examination only. Three of the candidates answered the Home Paper and the remaining candidate submitted a thesis entitled 'Replanning a Mains Distribution System.' Two of the three Home Papers were of first class standard and the third was a failure.

The answers to the written examination were an improvement on those of last year, four candidates obtaining good second-class passes and only one failing. The candidates showed a lack of fundamental knowledge. Also, it is expected that at Diploma level they should be more conversant with the latest published work.

Company News

GEORGE WILSON

Consolidated trading profit of George Wilson Gas Meters, Ltd., for the year to March 31, £46,070 (£29,884). After tax £16,956 (£8,712), etc., net profit £14,661 (£7,672), plus £2,475 provision against Government contracts no longer required. Net profit parent company £16,531 (£7,347). To general reserve £10,000 (£2,000), ordinary dividend, 15% (same), forward £6,530 (£5,421). The chairman, Mr. W. D. Wilson, states that the firm has since the date of the balance sheet formed a liaison with a company widely known in the gas and engineering industries—namely, Meters, Ltd.—which will result to mutual advantage.

THOS. W. WARD

Thos. W. Ward is maintaining the final dividend of 10%, less tax, on the £1,100,000 ordinary, making 15% for the year to June 30, 1951 (same). In addition, a sum to cover a bonus of 5%, less tax, will be set aside to be paid at an appropriate date. Group profits, after depreciation but before tax and certain specific reserve allocations, rose in the year from £1,538,000 to a new record of £2,371,000. The profit is higher at £992,676, against £561,076, after tax of £1,064,290 (£819,340) and after the following allocations: Reserves in subsidiaries £89,352 (£133,030), tax equalisation reserve £25,000 (same) and provision for contingencies £200,000 (nil).

After deducting minority interests of £40,797 (£42,236) and profits retained in subsidiary accounts £109,006 (£100,731), the parent's net profit is £842,873 (£418,109). Profit on sale of fixed assets and reserves not required is £33,385 (£85,668), plus surplus on sale of subsidiary shares of £506,567 (nil), making a total of £539,952 (£85,668). The foregoing profit of £506,567 has been transferred to capital reserve.

SAUNDERS VALVE

The accounts for the year ended April 30, 1951, show that the Company has more than maintained its satisfactory position of a year ago. Total production has increased and continues to do so. Notwithstanding the increasing cost of production trading results went up by £12,000 to £193,000, and the past year's operations according to the consolidated profit and loss account show an increased profit of £148,721, compared with £138,745 for the previous year. The charge for taxation amounts to £83,078, leaving a net profit after taxation of £65,643. The subsidiary company has retained its profit of £2,281, leaving available for appropriation in the holding company a balance of £63,362.

The Board is of the opinion that the dividend for the year should remain at 16% (less income tax), of which 6% (less income tax) was paid by way of interim dividend. After providing for the distribution and for the transfers to reserves a balance of net profit of £1,987 remains, which, added to the amount retained in the subsidiary, increases the consolidated balance carried forward to £13,941.

UNITED GAS INDUSTRIES

The 22nd annual general meeting of United Gas Industries, Ltd., was held on October 4 in London. Lt.-Col. W. Cabourn Smith, D.S.O., M.C., F.C.A., the chairman, in the course of his address to the shareholders, said: The trading profit for the year to March 31, 1951, at £540,004 shows an increase over the previous year of £55,070. Increase in profit, and increases in the rate of income tax and profits tax, have resulted in an increased charge of £50,843. The provision for depreciation has also increased by £6,955. As a result of these increased charges the amount available for dividends and appropriations is £1,455 less than the previous year. Stocks and work-in-progress are £108,632 greater than last year and our trade and other debtors have increased by £64,100. The increases mentioned above have turned our bank balance, which was £119,835 last year, into an overdraft of £32,487. Our current assets exceed our current liabilities by the very satisfactory sum of £1,162,255.

We have provided for the dividend on the preference shares as usual and are proposing the same distribution on the ordinary and deferred shares as last year, that is 17% on the ordinary and 1s. 9d. on the deferred shares, and also that £25,000 be transferred to general reserve account. The amount carried forward has been increased by £28,784. Our turnover once again beat the previous record, the increase for the year being £274,533. Our sales this year show a considerable increase over last year.

INFRA-RED in CONFECTIONERY TRADE

De la Rue Installation at Cadby Hall, London

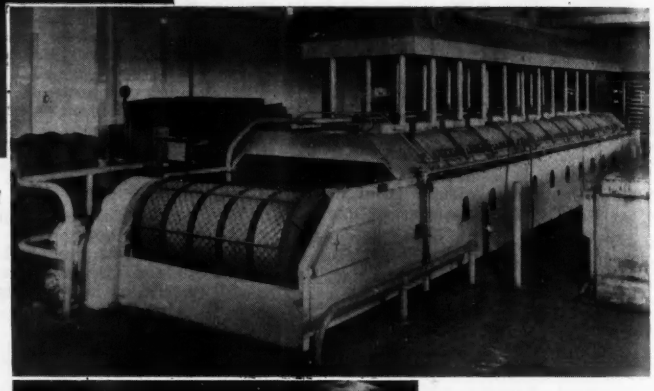
Delivery end of 38-panel gas-fired infra-red tunnel used for drying patty tins after washing.

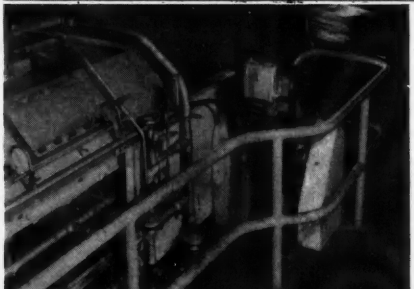
ON October 8 a visit was organised by the Gas Division of Thomas De la Rue & Co., Ltd., through the courtesy of J. Lyons & Co., Ltd., to inspect two infra-red plants supplied by them to the Cadby Hall headquarters. One plant is for drying tins and the other for the curing of pan-glaze on baking tins.

In the drying plant the tins, most of which are used for baking tarts. are fed automatically to a travelling wire-mesh belt, which passes through the tunnel oven which is fitted with 38 gas-fired infra-red panels. The belt is motor driven and the speed can be varied; but the average drying time for the tins is about three minutes. The tins are discharged by gravity, and the feed and delivery systems were designed and erected by Lyons engineering staff. The oven was designed to handle 20,000 small tart tins per hour, but it has already been found possible to increase this number to 22,000 and a target of 25,000 per hour is hoped for in the near future. This new method of drying has made a large saving in time and handling costs, and compared with the old method of centrifugal drying a great reduction of wastage has been achieved since, with the perfectly dry tins, the tarts are more easily removed after baking without risk of damage. The time taken for heating up the oven from cold is about 20 minutes.

To obviate the necessity of greasing pans for each successive bake, a special pan-glaze, 'Silcote,' developed by Albright and Wilson, Ltd., is sprayed on to the tins after washing and drying. They are then left for a 'flush-off' period of 90 minutes before being fed through the De la Rue oven for glaze hardening. The pans take about 45 minutes to pass through the oven, and the 88 infra-red panels raise the temperature to about 500°F., which is maintained for the whole of the curing time. After being treated in this manner the tins can be used for continuous baking for a period of seven to ten days, or in some cases several weeks, requiring only to be washed between each bake. When the tremendous output of Cadby Hall is borne in mind it is obvious that the time saved by this non-greasing process of baking is enormous.

The individual units, or panels, which are used to build up the De la Rue tunnels are each 2 ft. long, 1 ft. high and 4 in. deep and weigh 37 lb. Twelve neat gas flames heat them. Each panel consumes 20 cu.ft. of gas per hour at 500 C.V. and servicing can be done without dismantling the unit. Ovens of any size, and radiating 'walls' for an almost unlimited range of industrial processes where heat is required between 200°F. and 500°F. may be built up from the units, all specially designed for their particular purpose.

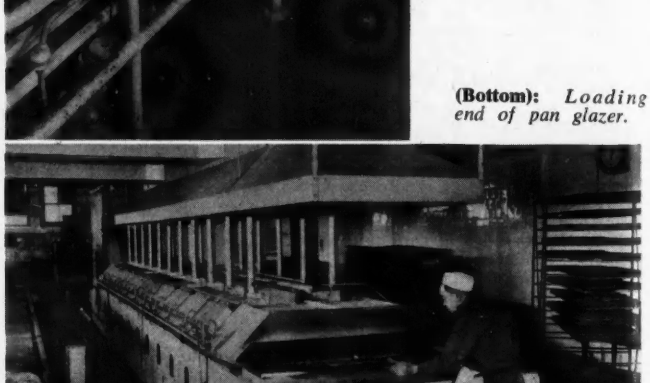




(Above): *Delivery end of 88-panel gas-fired infra-red tunnel used for curing pan-glaze on baking tins.*

(Left): *View showing variable speed drive unit and gas controls of pan-glazer.*

(Bottom): *Loading end of pan glazer.*



The Fuel and Power Shortage

On October 8 and 9 the Combustion Engineering Association staged a full-dress debate on the serious problem of the continued shortage of fuel and power and on the means by which recurrent crises could be staved-off and some more rational plan adopted on a national scale with full Government support. Attendance throughout—about 400 at each of the sessions—was indicative of the attitude of urgency which prevailed, as also was the presence of the Minister of Fuel and Power, Mr. Philip Noel-Baker, who 'stayed the course' of the first session at a time of pending General Election and who spoke at length on the gravity of the situation.

MR. P. A. SANDERS, C.B.E., D.L., J.P., President of the Combustion Engineering Association, took the chair at the opening of the conference, explaining that those present constituted a representative cross-section at high level of private and nationalised industry. The aim of the conference, he said, was to help industry to help itself and the nation to alleviate the very real difficulties which lie ahead. He was at pains to emphasise that essentially the fuel problem is not a political matter. The meeting was called at a time of impending catastrophe and they would have to devote their thoughts to both short term and long term policies. It would be years before power supply became such as to equal the country's needs. The question before them was in what ways could they better the perilous situation; and they looked for a lead to the powers that be.

A NON-POLITICAL ISSUE

In the course of his address, Mr. NOEL-BAKER said that the fuel problem was not a political issue. Any Government and every citizen, of whatever party, must face the issue with which they were now confronted now.

'You have called the conference "Meeting the Fuel and Power Shortage," continued the Minister. I make no complaint, but I believe that a better title in fact would have been "Meeting the Fuel and Power Demand." For the word "shortage" implies that in the United Kingdom we are getting or using less fuel and power than in times gone by. To the careless reader it might convey the impression that if we make an effort for a short time, the shortage will be got rid of and all will be well. I do not think the problem is like that.

'I spoke last July to the National Union of Mineworkers with great brutality about the increasing consumption of coal in this country. Between the years 1932 and 1938, the average of coal consumed in the United Kingdom was 174 mill. tons. Lest you should think the early slump years brought down the average, the average for five years up to 1938 was 175 mill. tons. In 1945, it was 177 mill. tons, in 1949 it was 195 mill. tons, in 1950 it was 202 mill. tons, and this year it is at the rate of 210 mill. tons. This year it will be nearly 20 mill. tons more than in 1948. But if the increase went on for two more years at the same rate as for 1950 and 1951, it would mean that we should use nearly 35 mill. tons more coal in the United Kingdom in 1953 than in 1948, and that in spite of the fact that less coal is going to householders than in 1938. Even allowing for the extra coal consumed in the form of electricity and gas and coke by the householders, there is still a small quantity less than in 1938.

'This is in spite of the fact that we are getting greater efficiency in industry, it is in spite of the fact that the increased use of oil has meant at least a saving of 6 or 7 mill. tons of coal since 1945; and I believe that unless something very drastic happens, this increase of consumption will continue.

'The electricity sent out has doubled since 1938. It has increased by 32% in the last three years; but the demand is certainly immense. The industrial demand ought, in my view, to increase by many-fold. We are now using one unit per manhour in the factories for three units used in the United States, and every Anglo-American Productivity Committee says that this is a major cause of their greater productivity over there—and the United States are still forging ahead.'

A World-Wide Problem

The fuel problem, said Mr. Noel-Baker, was a world-wide problem. In the United States the output of electricity had trebled in the last 20 years, it had to treble again in the next 20 years, but it would never catch up with the potential demand within that time, and sometimes, at various periods, they would have power cuts and brown-outs as they did in 1949 and would constantly be refusing new demands from factories and industries.

He was in Norway this summer. Norway used more electricity per head than any other country in the world. They produced the cheapest electricity, they were always regarded as pioneers. With their unlimited water power resources, they were better placed than most. Their supplies had been increasing exactly as they have planned, but last winter they had power cuts in the greater part of the country every day, and in a large part of the country they could use the electricity for only three or four hours, not because supply was less than they had planned or expected, but because demand was infinitely more. Industrialisation, the greater number of people employed, the rising standard of comfort in the homes of everybody were the causes.

In their own country they had invested since the end of the war £10,000 mill., and every pound of it meant an initial demand for fuel in some form. They had invested £2,500 mill. in machinery and plant (not counting buildings), which demanded power in the form of steam or electricity or gas. The sad fact was that in the United Kingdom much of their fuel and power was wasted. Of the potential heat and power in coal, they used perhaps 18% while 82% was lost. What were they to do? They must get more coal; but they must make better use of the coal they got. The tempo of the Coal Board's national plan must now be speeded up. Investment must go faster. But investment would not help them over the next year or two.

They must have more manpower in the mines, and they must set targets. They must repeat the operation successfully carried through last winter when they stopped wastage and added 17,000 men in five months. They must, in his view, get 10,000 more men into the pits by the end of January and 20,000 by the end of April.

Fuel Efficiency and Saving

He suggested that fuel efficiency was the direct concern of every board of directors, of every managing director, of each of the 180,000 factories in the land. Fuel efficiency could be conveniently divided into two stages which, of course, shaded into each other, which were part of one policy, but which it was useful to consider separately. The first stage was to eliminate all the forms of waste or avoidable consumption of fuel which could be done by better management without any major reconstruction or investment of new capital. He believed that it was possible to get immediate and large results for a very small expenditure, or, indeed, for none at all.

The second stage covered the design, the installation, and the layout of plant and equipment for the generation, distribution and use of fuel, heat, and power. That usually required capital expenditure, sometimes on a considerable scale; it usually gave a very high return. To get full benefit from it, work in the first stage must have been done very thoroughly.

What could be done in the first stage? Lagging of pipes, tanks, boilers, or surfaces could save up to 90% of the heat

that would otherwise be lost. Leaks of steam from faulty valves and joints caused great and readily avoidable losses. When there were leaks of air, of course insulation on a major scale could give very big results. It cost some money. There was the case of a firm which insulated the roof of a factory which had 99,000 sq.ft. surface. The insulation cost £8,000. It saved 625 tons of coal a year, and the capital cost was paid off in three years. In regard to the level loading of space heating plant, it often happened that because space-heating plant was not adequately looked after, the temperature in workshops was allowed to get too high, or some shops became overheated while others were at the normal temperature required. That waste could be largely dealt with by thermostatic control. The instruments or equipment needed were very simple, varied enough to meet any desired system of temperature control, and they cost very little.

There were, continued Mr. Noel-Baker, still many stokers untrained. The Ministry of Fuel and Power maintained a large staff of stoker demonstrators who went round the country teaching stokers, but there were still many thousands who wasted on the average about five tons of coal a week apiece. This showed that there was a vast field for saving at literally no cost at all. He believed that every plant with more than 20 workers ought to have people specially appointed to look after saving fuel—fuel watchers.

It was vitally urgent to save coal, not only because of their internal position, but because other nations needed the coal which they could then export, because if they had that coal they could buy the raw materials required to keep their factories running. Coal exports were now the most single crucial factor in getting iron ore for steel. Unless they could save, they would export less, and the prospect for Europe and for the world would be very grim.

Mr. Noel-Baker concluded: 'I have appointed two expert committees. First, there is what we call the Fuel Efficiency Advisory Committee under Major Gregson. Secondly, there is the Ridley Committee on Fuel Policy. I asked Major Gregson's Committee for an interim report, and they gave me a most valuable document. I have asked the Ridley Committee to give me an interim report as soon as possible. I am quite certain that the second stage must be seriously tackled for the winter of 1952-53. For this winter it is stage one that is the most vital thing. The problem which we all face is, I believe, in our economic life the most important single national problem with which we have to deal.'

Taxation Relief as Incentive

At the close of Mr. Noel-Baker's address, the CHAIRMAN remarked that they were looking to a lead from the Government in regard to the adoption of incentives for industrialists to improve their fuel using plants. There should, he strongly maintained, be some form of taxation relief for those who spent money to effect saving of fuel in the national interest.

During the ensuing discussion it was commented that with the present level of taxation and financial burdens industrialists were short of capital, and what was available was used for improvements in plant for primary production purposes; and it was added that in some, probably many, industries fuel costs were low relatively to total fuel costs. It was suggested that more education on the subject of fuel use was needed—and this applied to the top-rank executive just as much as to the humble stoker. There could be saving of fuel without a great deal of expenditure if there was improvement in the maintenance of existing plant—and individual firms should be allowed relief of taxation on every pound saved in fuel costs.

A further point raised was that, in view of the fact that coal was being 'worked out' and that labour difficulties in bringing it to the surface were increasing and would increase further, coal should be conserved for treatment by processes yielding the chemical products it contained. More attention should be paid to the harnessing of the tides (the Severn barrage scheme, for example) and the wind. One speaker asserted that the use of electricity for cooking, heating, and hot water heating implied great and costly waste of coal and that the major domestic heating load should be carried by solid fuel. It was also asked if there were possibilities in the use of methane from the mines.

Mis-use of Electricity

Mr. NOEL-BAKER replied at length to the queries raised, urging that more use should be made of the Ministry's mobile testing units as an aid to fuel saving at individual plants. They were, he said, inviting industrialists to save fuel in their own interests, and there were very real difficulties in applying taxation relief, although this matter was one of the greatest importance. Methane was now being piped on a small scale in South Wales, and underground gasification was going forward with promise. It might be five years or so before it became a commercial proposition, but he was optimistic that it would yield enormous quantities of gas from unworkable seams for the generation of electricity. The Severn tidal scheme came into the long term—the very long term—category. The short term policy was to derive electrical energy from coal. As for harnessing wind-power, experiments were in progress in the Orkneys and elsewhere.

The Ridley Committee appointed by the Ministry had been asked to make recommendations on the wider aspects of fuel policy. Were they, for example, employing electricity in the best way? Could gas be used advantageously instead of electricity for certain purposes? To what extent did the use of solid fuel enter into all-round fuel economy? For some purposes gas should be used rather than electricity, but when it came to public lighting he was told that lighting by gas was the most waseful possible use of coal. And yet the public lighting load by gas had doubled since 1946. In Sheffield industry was crying out for gas, the while there were thousands of public gas lamps in the city. Electric fires used coal at an average efficiency of 19%. Gas fires, he was informed, had an efficiency of some 32-35%. Solid fuel in modern improved stoves might give an efficiency of anything from 45% to 70%, and solid fuel should be used for domestic heating in the winter. As for the electric fire, this was a danger to the electrical industry itself, and the production of electric fires should be cut down.

ACHIEVEMENTS AND TASKS OF THE N.C.B.

Addressing the conference SIR HUBERT HOULDSWORTH, K.C., J.P., Chairman of the National Coal Board, said he had never disguised the fact that in his opinion the National Coal Board would never be able to claim that it had done its job until it was giving to the nation all the coal it needed for home consumption and for export, and of a suitable quality and at a price which would maintain satisfactorily the economic life of the country.

As far as the quantity was concerned, he would like to underline the word 'needs,' because he thought it was just as blameworthy for consumers to waste coal as it was for the National Coal Board not to secure the production of every ton of coal which could be obtained. This was, in fact, a national question, and unless consumers and producers were prepared wholeheartedly to help the country through this difficult position they could not hope to succeed satisfactorily.

He himself did not feel that the test should be one of pure £ s. d. This was no time to buy patriotism. It was a time for all of them on the fuel front, whether as producers, distributors or consumers, to have first before them the national need. The coal budget was all-important.

As far as the long term aspect was concerned, he was very confident that the Coal Board would do its job; but it would take time. There were encouraging signs from the long term point of view. Experiments were very promising, so promising that he felt that they were indeed on the threshold of big developments in mining technique and in mining machinery. Already they had one or two pits at about 60 cwt. O.M.S. overall, a thing which would not have been contemplated a few years ago. He felt further that very shortly those pits were destined to be, not at 60 cwt. overall, but at 80 cwt. overall. They had experiments with newly-devised machines suitable for thin seams—2¼ or 2½ ft. thick—which for some months had been increasing the output per manshift at the face by something like 50%. Time would be taken in getting the pits ready for the application of the new methods.

Response to Appeal

'You know full well,' continued Sir Hubert, 'the magnificent response that was made by the mineworkers in the early part of this year when the Prime Minister appealed for an additional 3 mill. tons during the first four months of the year. That was more than

achieved.' A request was made in August for increased Saturday working again, and he had before him the figures for the last eight weeks since that drive began. They showed that in total the increase in output over the corresponding eight weeks of last year was 1,599,500 tons—practically 1,600,000 tons—which was equivalent to an increase on the average week by week over those eight weeks of 200,000 tons more than in the corresponding eight weeks of last year. He again felt that that was a magnificent response on the short term.

The increase in production this year from the deep-mine pits would have been regarded as very satisfactory under normal conditions. From the deep-mine pits they had got 5.4 mill. tons more this year to date than they got in the corresponding period of last year, an increase of 3.5%. If the present rate of increase in output continued, the percentage increase for the whole year would be increased. It would not have been regarded as bad going in normal circumstances; but he was bound to regard it, because of the urgency of the economic position, as not satisfactory viewed against the national demands. And that was their problem.

Economies in Industry

He thought that their savings had to come in the main from industry. There was no permanent useful function served by robbing Peter to pay Paul. The figures, as far as the domestic consumer was concerned, rather illustrated that. In 1938 it was estimated that, including the mineworkers' coal, something like 50 mill. tons of coal were used domestically. In 1950 the amount was estimated to be 37 mill. tons—13 mill. tons less. Although the figures of the increasing consumption domestically from gas and electricity might not be ascertainable with complete accuracy, he thought they were approximately right. At any rate, statisticians approaching the problem quite independently seemed to be pretty near agreement on the total. The figures that the National Coal Board gave him were that in 1938 the coal for the gas and coke used for the domestic consumer was about 9 mill. tons and that in 1950 it was 16 mill. tons; and that the corresponding figures for electricity were 4 mill. and 9 mill. tons respectively. If these figures were approximately right, it meant that about 1 mill. tons less was going for domestic purposes in 1950 than in 1938. But they must have regard to the growth of population, and if they had, it meant that in 1938 there were 1.36 tons per head of population used domestically as against 1.26 tons now. That might be the measure of the cut on the domestic consumer, but at any rate there were very few domestic consumers who would consider themselves in winter time to be satisfactorily supplied for their cooking and heating purposes in their homes, which emphasised the need for the development of proper methods of space heating.

But he could not believe that there was not a considerable saving to be made in industry. In those industries with a 2% cost of fuel out of the whole of the 100% costs, it might be that in normal circumstances the higher management did not interest itself too acutely in the matter. The important thing today was the coal budget, and, therefore, where only 2 or 3% of cost was represented by fuel, managements must as a patriotic duty today direct their interest to securing the maximum of fuel economy.

A Suicidal Policy

How had they struggled on so far? They knew full well that it had been done partly at the expense of the export trade, a suicidal policy nationally if continued to long. In the coal industry they were extremely short today of pit props. They could get more pit props if only they could supply more coal to those countries that could put the pit props at their disposal. The export trade in coal was a vital necessity to this country, and they were suffering greatly from the curtailment which had been necessary to allow them to struggle through internally.

A second factor was that they had been living on their fat. At the end of April, 1949, they ended up with about 10¼ mill. tons of coal in stock. At the end of April, 1950, they ended up with 9.2 mill. tons in stock. If they were successful in getting up stocks at the beginning of November this year to the 17 mill. and if consumption continued to increase, as was likely, industrially during this winter, they were likely to end up in April, 1952, with 7 mill. tons. In other words, they would have struggled through at the expense of exports and at the expense of something like 3½ mill. tons reduction in end of winter stocks during the last two or three years.

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STRIKING DISPLAY AT HULL

Judging by the favourable comments and the attention it attracted, the North Eastern Gas Board (Hull Group) stand at the Industrial and Modern Homes Exhibition in the City Hall, Hull, 'stole the show' with this display. The colour scheme of blue-grey, violet, beige and white, was enhanced with the skilful use of concealed fluorescent lighting and spotlights. The Raymond cooker (shown for the first time in Hull) and the Electrolux refrigerator took the centre of the stage, and showed up brilliantly against a flock-finished violet background and black rubber tiled floor.

Safety for Gas Fires

A NEW standard of safety for gas fires, including the provision of guards for them, has been drawn up by the British Standards Institution. A similar measure was announced last week for electric fires. The gas specification calls for guards which will prevent contact with the fires by clothing. A method of testing their efficiency is given. The guards are not intended to give complete protection for unattended young children.

To be safe in normal circumstances, the reports says, guards must pass two main tests. The bars must be close enough together or far enough from the flames to prevent clothing swinging through. Although the main gas fire manufacturers have agreed to this safety standard, they are waiting for local gas boards to ask them to fit guards.

The new specification takes the form of an addendum to B.S. 1250, Part 2, 1946, which may be obtained from the British Standards Institution, Sales Department, 24, Victoria Street, S.W.1, reference P.D. 1262.

Councillor J. Waterson (Chadwell St. Mary, Essex) has been appointed a member of the North Thames Gas Consultative Council; Councillor Mrs. Ethel Naylor (Whelley, Wigan), a member of the North Western Consultative Council; and Mr. C. E. Bolwell (Bournemouth), a member of the Southern in place of Mr. J. R. Woods (Southampton), who has resigned.

C.E.A. CONFERENCE

The Supply and Effective

THE ELECTRICAL POWER GAP

BY C. T. MELLING, M.Sc.Tech., M.I.E.E., M.I.Mech.E., M.Inst.F.

(Chairman, Eastern Electricity Board ; Chairman, British Electrical Development Association).

THE future of British industry depends on power—electric power, obtained for the most part from coal. We require more electric power for industry. Unfortunately, instead of more power for industry, we now have load spreading and load shedding. In spite of record installation by the British Electricity Authority of new generating plant, we are still short. What is being done to get over this power shortage? Since the war over 3 mill. kW of generating capacity has been added to British power stations and last year the B.E.A. installed approximately 1 mill. kW of new plant. The B.E.A., in fact, harnessed to this programme all the manufacturing capacity which could be utilised, but it was soon found that there was insufficient manufacturing capacity available to provide all that is required on the present programme, which provides for a gradual rise each year up to a figure of 1,800,000 kW in 1952—a figure recently reduced by the Government to 1,500,000 kW.

The Export Drive

Manufacturers have export orders to fulfil, and as this country's economy is now largely based on exports they did not consider it possible to devote all their capacity to the British Electricity Authority programme. In fact, 40% of the power station plant produced in this country is exported and, allowing for plant for other purposes, only about 40% of the country's manufacturing capacity is used for the B.E.A. programme. If half the capacity used for export and other purposes were used for the B.E.A. programme there would be an immediate increase of 50% in the power plant which would be installed per annum, and this would be a material help towards closing the power gap. This is a matter outside the control of the B.E.A. But do not think that the B.E.A. is just waiting on events; it has, in fact, arranged with manufacturers to increase their manufacturing capacity by layout of new shops and, indeed, a new factory for the production of those items which are holding up the generating programme. This takes time and it would be difficult for the boiler and tube manufacturers to get their new production plants in operation to help the immediate programme. For the next few years, therefore, there will be insufficient generating plant to meet the requirements of industry.

This is a most serious situation. We have not got sufficient electric power. But are we, as a nation, determined to overcome this difficulty? Have we, as a nation, decided to remove the hindrances and bottle-necks and allow the B.E.A. to provide us with the necessary electricity? If we, as a nation, are determined to have more power, then there are four essential steps we must take.

Firstly, planning procedure must be simplified in order to remove the delays, frustrations, and expense incurred in the present procedure.

Secondly, sufficient manufacturing capacity must be available for the generating plant programme, and this means for the present a reduction in the capacity for export and other purposes.

Thirdly, there must be a priority of materials—on the lines of the highest priority system used during the war—which will not only place power station plant in a priority position, but keep it there.

Fourthly, sufficient capital resources must be made available to meet the generating plant programme.

If it is the national will that the power gap be closed, if it is considered essential for industry to have available the power resources it requires, it can be done. But it requires national decisions outside the control of the B.E.A.—decisions which will be upheld until there is adequate power to support our national economy. This applies to distribution work as well as to generating station.

Whatever decisions are taken nationally, there will be a shortage for the next few years until the programme for large power stations closes the power gap. But what else is being done to meet this difficulty? The British Electricity Authority is retaining and overhauling power station plant which would otherwise have been scrapped years ago and is adding small generating units as far as this can be done without hindering the main power station programme. Then there are private plants installed by industrialists. At one time some supply authorities applied restrictive conditions on the installation and use of private plant, but all such restrictions have now been removed by the area electricity boards, subject, of course, to technical conditions where parallel operation applies. Moreover, the area electricity boards are prepared where practicable to purchase from industrialists their surplus power during peak hours at reasonable terms. The present position is that the average fuel efficiency of generation in the B.E.A. power stations is 22.7%, although in the best stations the efficiency approaches 30%. This average efficiency sounds low, although higher than the efficiency achieved in much of the fuel usage in this country, but there has been a steady increase in power station efficiency. Do not let us imagine that the maximum efficiency has yet been reached.

I had a discussion recently with the president and vice-presidents of an American utility where there are two new stations in course of construction with an estimated efficiency of 38%. If the Americans can do it, so could we, with high grade fuel, but, in the meantime, we must ensure that all the available manufacturing capacity is used for producing the maximum output of generating plant. Only when we have closed the gap, dare we go for higher efficiencies still, because a change in the programme would mean delay in manufacture. Of course, American power stations of the type referred to above get better coal than we burn in this country and could not get the high efficiency they expect if they had our low grade fuel. There are many users in this country who require a high grade of coal—gasworks, coke ovens, and domestic users—whereas, provided the British Electricity Authority has an assured supply of low grade coal of consistent quality over a long period and at a reasonable price, the burning of low grade fuel in power stations is an efficient factor in the national fuel policy. There is one thing necessary, however, for the fulfilment of this policy—namely, a satisfactory price structure which gives an economic attraction to the burning of low grade fuel.

Use of Back Pressure Plants

Much has been said in various quarters about back pressure and pass-out sets for power generation in factories. Where there appears to be a case for such sets, a careful examination should be made and the matter discussed fully with the area electricity board concerned. There is much misapprehension about the attitude of boards in this matter. For example, my Board and other boards too are willing to purchase surplus output from back pressure sets operated by industrialists firstly during peak hours to help the power shortage, and secondly during non-peak hours where they help fuel efficiency.

The elimination of waste of any sort, whether for heating, lighting, motive power, or any other purpose, helps both the peak problem and fuel efficiency. In some respects, however, peak economy and fuel efficiency do not go together. For example, for long-hour space heating the use of solid fuel in modern stoves or grates helps plant shortage and fuel efficiency. On the other hand, for short-hour use, say, for breakfast rooms of domestic premises, solid fuel appliances are wasteful of fuel and electrical heating is then in the interests of national fuel efficiency, but in winter this may mean an addition to the peak demand, particularly the morning peak. Although these enclosed stoves and fires which burn all night have not the homeliness of the conventional open fire or the convenience of electric fires, I hope that consumers will adopt them for winter use in order to help the peak problem, keeping their electric fires for use when there will be no addition to the peak demand. A major contribution to solving the peak problem has already been made by three electricity boards who

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Use of Gas and Electricity

THE CASE FOR GAS

BY J. H. DYDE, M.Inst.Gas E.

(Deputy Chairman, Eastern Gas Board : President, Institution of Gas Engineers).

FOR many years eminent persons in the gas industry and fuel technologists generally have extolled the virtue of chemical conversion of those qualities of our coal as will yield to such processing as carbonisation, gasification, and hydrogenation, and in being so treated yield in varying degree gaseous, liquid and solid products. These products have been found to have a value in the diversity of their application and use far exceeding that of the original coal substance. It would seem basically unsound, therefore, that any coals capable of such treatment should be exported unless there is a surplus beyond the full needs of our carbonising industries.

The two processed fuels of the gas industry, gas and coke, are complementary. In fact, we are unique in that we have wide experience in the marketing and application of these fuels to provide a complete domestic heating service, including cooking, summer and winter water heating, and space heating. Our process is flexible in that coke can be gasified, thereby enabling us to have some control over the relative supplies of these two fuels.

A Word of Warning

I must, however, sound a word of warning. It would not be in the interests of the industry or of general fuel economy if, by reason of being short of coal or plant capacity, we had to carry the gasification of coke to the extent of robbing the domestic coke market unduly. The policy we have been pursuing in the gas industry—and this is on the lines of the recommendations given in the Simon Report on Domestic Fuel Policy issued in 1946—is that coke and solid fuel generally are the fuels which should be used to take up the space heating and hot water requirements of the coldest part of the winter, usually a matter of some 120 days, when the home needs almost continuous warmth. If the householder is unable to secure the minimum requirements to cover this period, then there will be an inevitable inflation of the peak loads for both gas and electricity, which we know that the electrical industry cannot possibly meet, and which the gas industry in its present stage of development—and, in certain quarters, where the added load of industrial demand due to rearmament is a heavy burden—would also be very hard pressed to meet. One has to be realistic in facing this issue of the peak load for, after food, warmth is a bodily requirement which people will have by any means at their disposal and almost at any cost. Warmth, in fact the great bulk of all our fuel services, must come from coal, and therefore it would be appropriate for us to consider what fuel or combination of fuels makes the minimum demand on our coal resources. This leads me naturally to a consideration of the gas industry's production efficiency coupled with the practical efficiency in use which in turn enables us to determine coal economy.

Production efficiency of a gasworks has been the subject of much contention, but for our present purpose suffice it to say that if you allow credit for the thermal value of the products, tar and benzole, a matter of 7½% to 8% of the original value of the coal substance, then, on the average each two tons of coal processed at a gasworks at present produces 150 therms of gas and one ton of coke for sale. If this coke did not go into the solid fuel market it would have to be replaced by mining at least one extra ton of coal. Thus the production of 150 therms of gas can be regarded as having used up only one ton of the nation's solid fuel resources.

By taking the latest figures of production efficiency for the electricity industry, 21.3%, and relating it to a ton of coal of 300 therms (that is the same unit as used for gas computation) it can be shown that for every ton of coal consumed at the power station 1,800 kWh of electricity is produced.

By the use of these two factors, the quantities of gas and electricity used on various appliances can be related directly to the net coal requirement. If this is done using appliance test bench efficiencies, as set out in the Egerton Report, it will be found that in all heating loads heating by gas requires approximately half the coal that is required for heating electrically. In order, however, to dispel any possible criticism that may arise resulting from the acceptance of test bench appliance efficiency as against efficiency in practical use, I would refer you to the tests that have been made in the Building Research Station's experimental houses at Abbot's Langley. The difficulty as between test bench efficiency and practical use is disposed of here by recording domestic fuel usage in the provision of a service comprising lighting and small power uses, cooking, water heating, laundering, space heating, and refrigeration.

Total Service

Some of the functions of the total service may be carried out by more than one fuel, or one fuel used in a single appliance may perform several functions simultaneously. Moreover, the relationship between functions and fuels may be different at different seasons of the year. By applying the factors I have already given you, the quantities of gas and electricity used by a household can be directly related to the net coal requirements expressed in tons, and this figure may be added to the weight of coal or coke purchased as such to give the total annual net coal requirements of a particular combination of fuels and appliances. When this method is applied to the figures obtained from the first (unoccupied) stage of the Building Research Station's experimental houses at Abbot's Langley, it is found that the net coal requirements of the various systems varies from four tons per annum to as much as seven tons per annum. The tests show that with a suitable combination of gas and coke appliances a modern service can be given for the expenditure of as little as four tons per annum, showing an annual coal saving of 1½ tons per household compared with the pre-war average given in the Egerton Report, and up to two tons per annum saving in comparison with alternative methods. It is significant to note, too, that all experimental houses containing more than one solid fuel appliance show high coal requirements. This would also be the case where solid fuel is used for summer water heating. All houses using solid fuel for cooking have high coal requirements. Two of the highest coal requirements, however, are to be found in those houses where the following combinations exist:—

(1) Where the main space and incidental heating is carried out by electric tubular heaters and fires, with a domestic coke boiler for the summer and winter hot water heating, and where the cooking is carried out by electricity.

(2) Where the main space heating is carried out by an openable stove with convection, all other services, summer and winter hot water, cooking, and incidental space heating being carried out by electricity.

These tests do support very clearly the view that electricity is much more costly in coal consumption for the provision of such services as cooking and all forms of heating than is the corresponding application of gas.

I have taken some little time in trying to establish the important and relative position that gas utilisation holds in the conservation of our fuel resources, but I wish to emphasise the substantial contribution that the industry can make towards the solution of our present difficulties and probably toward a permanent solution of our national fuel problem.

In addition to the industry's ability to provide fuel services with the minimum demand in coal, there are two other important issues which must be considered. Firstly, the industry's ability to meet peak loads, and secondly, the provision of its fuel services at a relatively low requirement of capital investment per unit of demand. The meeting of peak load demand should be viewed from two aspects—first of all, the short-term hourly peak demand. In this respect the ability of the industry to store gas enables the hourly peaks to be met. There is no question of our suggesting to our consumers that they should switch off or discontinue the use of their appliances at any time of the day. The other consideration is that arising out of a prolonged peak demand of seasonal charac-

ter. It is usual practice to meet this demand by the gasification of coke and the enrichment of the gas by hydrocarbons from the cracking of petroleum oil. This is a process which can be carried out at a very high rate of production in plant of lower capital cost per unit of production than base load carbonising plant. There are other methods, too, of meeting exceptional peak loads, such as by the direct thermal cracking of petroleum oils, and, in small isolated stations, of storing liquid petroleum gases. A good deal of development work in this connection is under way and affords still another indication of the flexibility in the methods of gas production.

On the second point, Mr. F. M. Birks, in his Presidential Address to the Institution of Gas Engineers in May of this year, stated that it can be shown that not less than twice the amount of capital is required to supply current to an electric cooker as is needed to furnish the gas for a gas cooker.

A Development Programme

On the basis of the arguments that have been advanced, it is claimed that an acceleration of the gas industry's capital development programme is in the national interest an important, perhaps vital, contribution to solving the nation's fuel problem. The industry's development programme would entail:—

(1) Expanding its domestic heat services load by the joint use of gas and coke, in the following manner:
   (a) that in addition to the industry's main load of cooking gas may be used to an increasing extent to meet the incidental heating requirements of the cool days between the seasons;
   (b) that gas for summer water heating be encouraged as providing a better service with a saving in coal requirements as compared with solid fuel;
   (c) that it is recognised for some years to come, and in fact until such new methods of gas production as yet in the development stage are realised, that coke and solid fuel (preferably of the smokeless type) be employed to carry the main space heating and winter hot water requirements;
   (d) that sufficient coal of suitable quality be made available to maintain a corresponding high quality of coke for that purpose.

(2) Meeting the ever increasing demand by industry for gaseous fuel, recognising that this is a specialist application of fuel in the same way as fuel supplied to electricity stations to transmit as power to industry.

It is realised that these proposals envisage an acceptance of responsibility by the gas industry for dealing with heating services in the same way as there virtually exists today an acceptance of responsibility by the electrical industry for lighting, power, and communications. It would seem quite wrong in the national interests to accept that gas and electricity are now alternatives in all except lighting, power, and communications.

To assist these proposals a plea is made that the heavy purchase tax on gas space heaters and gas water heaters be removed. Fortunately, and in contradistinction to the electricity supply industry, the gas industry controls its own commercial policy. The very large bulk of all types of gas appliances sold and fitted are dealt with by the area gas boards, and selling could therefore be controlled in relation to available production plant.

Before and during the war there was a general practice in the industry to discard its own generating sets and take a bulk supply from the electric grid. In the reconstruction of major works nowadays the position is reversed. Steam is being generated from waste heat at higher pressures, and balancing sought between power and process requirements, with considerable resultant saving and the production of sufficient electricity to meet the complete electrification of the works. Dr. J. Burns, the Chief Engineer of the North Thames Gas Board, in a paper to the Institution of Gas Engineers last May, dealt with this subject and mentioned that the advent of the gas turbine had introduced interesting possibilities for the direct conversion of waste heat into electrical energy. The indications are that it should be possible to generate between 50 and 70 kWh per ton of coal carbonised from waste heat, and after satisfying internal requirements to make available for export 25 to 45 kWh per ton. It would be interesting to know how many other industries, by balancing their power and process requirements, could produce an overall saving in their total fuel balance-sheet and to the advantage of coal conservation.

Modern Appliances

While on the subject of fuel saving, I want to emphasise the very important contribution to the nation's fuel problem that is being effected by the substitution of modern appliances of higher utilisation efficiency. This is most striking. I have before me figures from the Research Laboratories at Watson House which show the effect in fuel saving that has taken place over the last 50 years. Taking the index of efficiency of the modern mass-produced cooker which is now being supplied to new housing estates as 100, and comparing it with five of its predecessors ranging from 1900 to the present day, there is an increase in this index from 61 to 100, or, in the annual amount of gas used for cooking for a family of four, a reduction from 131 to 80 therms per annum. This, in terms of coal consumption represents a reduction from 5.4 to 3.3 lb. of coal per day for cooking, a spectacular saving of 40%. Colonel H. C. Smith, Deputy Chairman of the Gas Council, recently drew attention to this important issue and gave a figure of 700,000 tons as the annual saving of coal if all out-dated cookers now remaining were replaced by those of modern design. After a delay in this replacement programme occasioned by the war, the gas boards are actively engaged in making up arrears, and it would be a great pity if the manufacturers were unable to secure the steel to make this saving in fuel possible. Similar considerations apply to other types of gas appliances, in particular the modern convector gas fire, which shows savings of 20% to 30%, and also the modern solid fuel grate.

I have not yet mentioned an item which was greatly stressed in the Egerton Report as a means of securing reduction in fuel wastage, and that was the insulation of houses. I can only report that I have not yet seen a Council house in the post-war programme which conforms to or even measurably approaches the standards laid down. I do not believe that the saving in fuel would be directly proportional to the effectiveness of the insulation because much of the saving would, in my view, actually be taken up in the increased conditions of comfort for the occupants.

The Coming Winter

Finally, there is the question of what to suggest in regard to the coming winter. My view is that the domestic consumer should be exhorted to save the precious solid fuel until it is really cold. The use of solid fuel for short time intermittent space heating and water heating is wasteful, such incidental heating being better provided by the processing industries, to whom the raw coal material could be transferred with advantage.

If a crisis comes, and the gas industry is unable to secure sufficient coal to meet its demands, the first reaction will be an acute shortage of coke, and, secondly, the possibility of reduction in district pressures. This latter is a recourse which we do not like and which we do not wish to see happen. Pressure reduction is not effective in securing economy until it becomes drastic at a figure of about 40% of normal pressure. At that stage it brings an element of danger in its train from the instability of by-passes. It also acts unfairly on consumers in many districts where there are differences in altitude and penalises one class of consumer as against another—for instance, it renders virtually unusable the instantaneous water heater, whereas the people employing thermal storage water heaters get a reasonable supply. Its only virtue perhaps is that the supply is not entirely cut off and that some service is still obtainable with patience.

THE ELECTRICAL POWER GAP—
Continued from p. 160

have banned the general sale of electric fires. A similar point arises with water heating and cooking. As regards a long term programme of fuel efficiency in relation to the use of electricity, the position is clear. We must use more electricity if we are to conserve the national resources of fuel. This is not contradiction in terms; we must use more electricity and less raw coal for motive power. There is scope for saving about 1½ mill. tons of coal per annum in the textile industry by further electrification, and other manufacturing industries also offer scope for substantial economies. There is greater scope still in railways and mines. For example, the electrification of British Railways in place of steam locomotives would save nearly 10 mill. tons of coal per annum.

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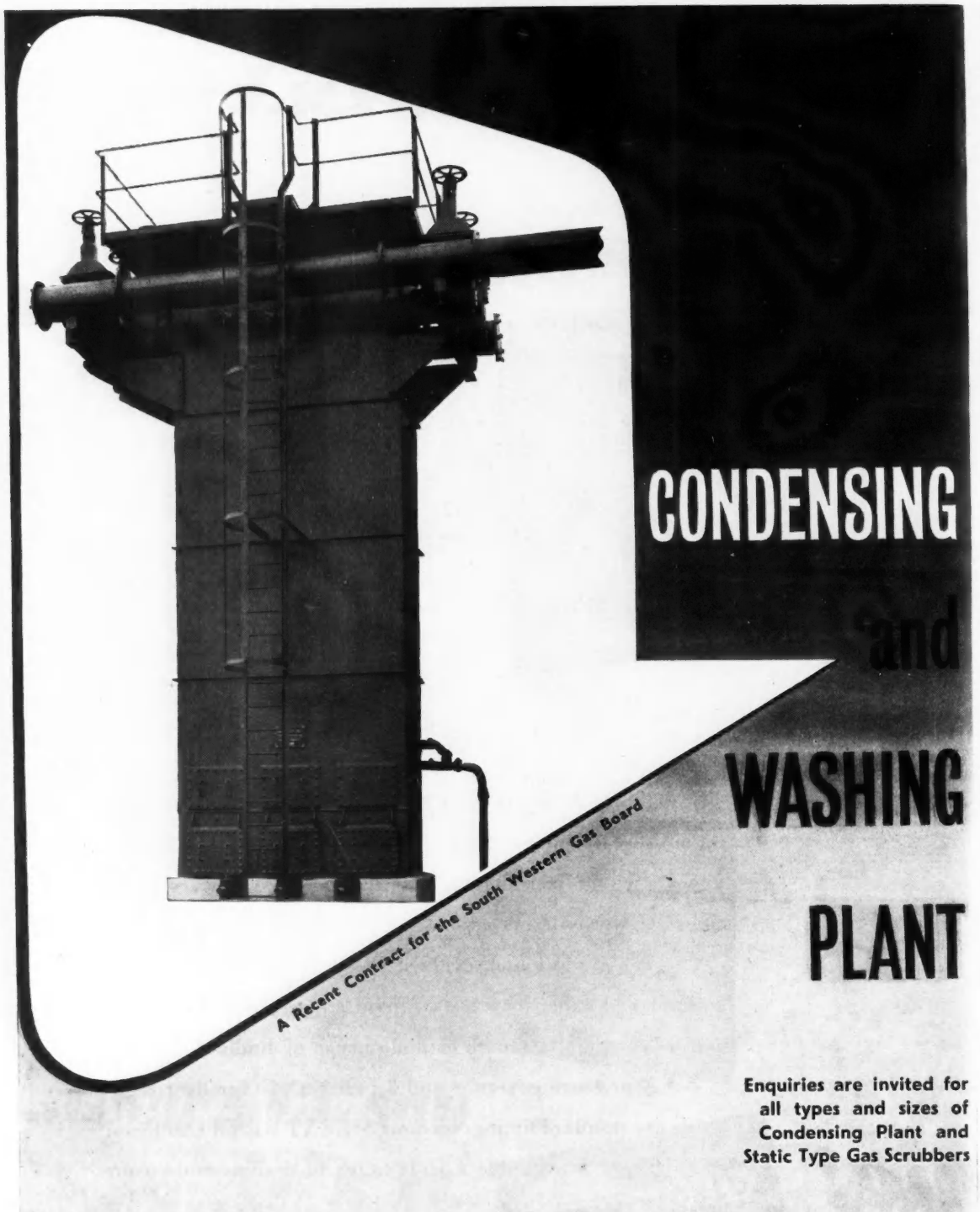

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C.E.A. CONFERENCE

Long Term and Short Term Policy

THERE were two addresses at the conference, one by Mr. B. E. A. Vigers, dealing with short-term policy, the other by Mr. Oliver Lyle, with long-term policy. Sir ERNEST SMITH, C.B.E., Chairman of the Industrial Coal Consumers' Council, presided at the session when these addresses were given.

In his opening comments, Sir Ernest referred to the work of the Industrial Coal Consumers' Council. Neither the public nor the Press had so far been admitted to meetings of the Council, but its work, while not being publicised, had gone on quietly and effectively in co-operation with the Ministry of Fuel and Power and the National Coal Board. The work was, in fact, an excellent example of team effort in 'helping the cause.' They had been told by the Chairman of the N.C.B. during the conference that by the end of April, 1952, the country's coal reserves might well have dwindled to some 7 or 7½ mill. tons, and they had also been told of difficulties in transport. The situation was not one which could be viewed with any element of complacency, and it was up to industry in general to act now. The Consumers' Council had warned about the difficulties which beset the coming winter, but he was sure that if only industrialists knew enough about fuel economy they could save all the coal needed to see the winter through, irrespective of weather. Sir Ernest gave telling examples from his experience during the war of the great decreases in gas consumption coincident with great increases in output brought about by quite elementary precautions in seeing that gas was not wasted. It was, he continued, no use sending Ministry of Fuel men into works with partial experience and knowledge of fuel to talk to the men operating boilers unless from the top-rank management there was enthusiasm, a sense of urgency, and insistence that something had to be done. The whole problem should be tackled on the basis that human beings, with all their personal characteristics, were being dealt with; the matter should be approached in a spirit of friendly co-operation. And in regard to fuel policy generally it would serve a useful purpose if public spirited people would bring into existence small knowledgeable committees to offer advice and help on a voluntary basis. Such a system had much to commend it, and it had worked to excellent purpose in the gas industry.

Short Term Policy

This aspect of the fuel problem was in the hands of Mr. B. E. A. VIGERS, Chairman and Managing Director of Laporte Chemicals, Ltd. He remarked that in the majority of industry the main problems which occupied the attention and efforts of top management were the maintenance and improvement of techniques of production—problems of obtaining raw materials, personnel problems, labour turnover, and all the difficulties in dealing with controls.

When they studied costs of production all these factors were significant and therefore occupied close attention. But fuel and power costs in most cases would not exceed 1% or 2% of the total, and as long as these services were reliably maintained, they did not receive much consideration. They were often left in charge of a man of not very high calibre—and even if he was a good fellow with ideas for improvement he did not get much support.

Today this attitude to economy of fuel would no longer suffice. British industry had to take steps to economise in its fuel consumption in order to survive. If too many people left it to the other fellow to make the economies, they would all go down together. They were faced with a continuing actual shortage of fuel, and even if fuel appeared to be only a small item in their cost make-up, few industries could survive without it.

He need only remind them of the effects on their cost of production if production itself was stopped, if only temporarily because there was no gas for heat treatment, no steam for dryers, no warmth for the workers, or shortage of steel and other raw materials which depended mainly on coal for their production. Overheads could not be switched on and off, and there could be practically no industry in the country whose cost would not rise alarmingly if lack of fuel should mean shut-down or reduction of production. No industry could afford to regard fuel economy as other than a vital issue.

An Inexcusable Waste

He believed that managements should make fuel a prime interest of someone at or near board level. Secondly, there should be appointed an individual with executive authority to carry out the policy, and he should be given support, encouragement, and facilities. The ideal which could and should be adopted in the larger concerns was to employ a special fuel efficiency engineer, and when an adequately trained man had been obtained his work would be divided into two main parts—psychological and technical. The psychological aspect was largely concerned with waste. It was most certainly the most difficult part. From the technical angle, the man appointed would almost certainly be able to suggest plant improvement and modifications to processes which would result in savings. It was usually found that such modifications and improvements would pay for themselves and yield a good return on the money expended.

Mr. Vigers went on to consider ways in which heat could be conserved and used to the best advantage.

Towards the close of his address, Mr. Vigers stoutly maintained that heat should be made first to generate power, and power should not be used to generate heat except where the highest temperatures were required. In fact, electrical energy might well be regarded as the equivalent of heat at a very high temperature. It was inexcusably wasteful to use it for such low temperature requirements as space heating and water heating.

'This rule of thumb,' he continued, 'is only one way of putting a fundamental law of nature which makes it inevitable that by any known means of converting the heat of burning coal into electric power about 70% of the heat must be thrown away. In fact, the B.E.A. throws away more like 80%, so you will see that quite apart from present-day power station capacity shortage it is in fact waseful of fuel to use it for heating via the electrical way unless some special consideration applies, such as the high temperature requirements of special steel melting or the production of elemental phosphorus, or for applications which are not readily soluble by other means, as, for example, high frequency apparatus for moulding and seaming plastics.

'Let me beg of you,' concluded Mr. Vigers, 'to cast out from your works and officers and canteens all electric water heaters and cookers and replace them with more thermally efficient apparatus. If you do not, how can you expect success for a campaign to reduce the domestic heating peak load in order to leave essential power available to the industries by which we all live?'

Long Term Policy

Dealing with long-term policy, Mr. OLIVER LYLE said at once that he would like to dispel any feeling of optimism regarding the future of fuel in this country during the coming 10 years or more. There was going to be no rosy dawn, no golden sunset.

They had been told that the British Electricity Authority would by then need 30 mill. tons more of coal; the iron and steel industry would require something like 10 mill. tons more of coking coal. Other users would need 30 million tons more. On top of all there was an estimated shortage of 10 mill. tons. The National Coal Board had given a figure of 13 mill. tons extra in that time. The picture was the reverse of rosy.

Something might be done by way of substituting oil for coal and by the further use of hydro-electricity, but it was to industry generally that they looked for savings in fuel—and such savings involved capital expenditure. It could be taken that industry renewed anything from one-fortieth to one-twentieth part of its plant each year. In quite good practice the life of a plant could be considered at 20 years, when it could be replaced by plant doing a better job and consuming half the amount of coal.

The power situation was worse than the coal situation. The British Electricity Authority was going blissfully along with its head in the clouds and its feet in the mud, and with the present programme supply would not catch up with demand. If they were going to get the power they needed in industry, they could not rely on the B.E.A. But if every factory and commercial premises generating 10,000 lb. of steam and over per annum installed back-pressure turbines and the B.E.A. co-operated in taking surplus current, this would save the B.E.A. millions of tons of coal and would save the nation.

Industry's Apprehension

'INDUSTRY'S Fuel Problems' was the subject of an address by SIR ARCHIBALD FORBES, President of the Federation of British Industries. He said there was a growing realisation that an improvement in the economic situation of this country depended on raising the volume of production of goods and services mainly by increased productivity. To achieve this there must be a sufficiency of coal and electric power. Yet in each year since the end of the last war industry had suffered from a cramping shortage of both these essential requisites to production. In the industrial field such shortages not only operated directly to curtail production but had serious consequential effects in dislocating factory organisation, diverting thought and energy to the evolution of stop-gap measures and generally undermining the confidence both of producers and customers.

Result of Productivity Increase

The increase in industrial consumption of fuel and power since the end of the war was in the main due to the notable increase in productivity which had been achieved in that period. It was unrealistic to point to this increase in consumption as a reason for shortage in supply. If increasing industrial activity was accepted as essential, then supply ought to be planned to march with it. The alternative was to accept restricted production and a lower standard of living.

The fundamental trouble—which was equally the root cause of the country's economic instability—was the insufficiency of the output of coal. Even to such extent as industrial requirements had so far been met it had been at the expense of drastic cuts in the needs of the export market and those of the commercial and household consumer. And it was apparent that, unless there was a material improvement in output, shortage of coal might well become the limiting factor on the generation of electricity in the near future.

In considering the existing level of coal production one was driven to the conclusion that the increase in the mechanisation of mining operations and of handling processes had not led to the increase in productivity which corresponding developments had brought about in manufacturing industry. Moreover, some 5% to 6% of last year's output derived from open cast working, which could only be regarded as a temporary expedient.

Industrial consumption of coal was rising steadily and at about the same rate as industrial productivity. Each winter since the war had witnessed a desperate struggle to build up sufficient industrial stocks to face winter weather with confidence. Once more on the threshold of winter the balance was so precarious that adverse weather alone might be sufficient to cause widespread dislocation. The slight comfort that might otherwise be gained from the marginal increase in industry's coal stocks this autumn was offset by fears concerning two other matters. The first was that the shortage of fuel for domestic heating might react on the supply of electricity and of gas to industry by increasing the domestic demand for these. The second was that the railway system might be unable to cope with any exceptional movement of coal during the winter (including imported coal) because of the inability to find adequate skilled manpower and the possibility of a shortfall in supplies of suitable coal for firing locomotives.

Sir Archibald Forbes then turned to the extent to which industry could assist itself in this situation by ensuring that coal was used with the highest practicable economy and efficiency. While, he said, considerable progress had been made with the installation of efficient fuel burning and heat using plants and with the harnessing of waste heat, a large number of old and inefficient installations still existed in the industrial as well as in the domestic sphere. If, at one stroke, these could all be replaced with more modern equivalents this would make a significant contribution to overcoming the shortage of solid fuel in the short term.

Financial Burdens

The situation was in part due to the inability to carry out modernisation of plant during the war and the restrictions upon the purchase and supply of capital equipment which have applied in the post-war years. If control of capital investment was to continue it might well be that the relative importance of expenditure in this direction ought to receive further consideration. But it was also necessary to bear in mind that as a result of the heavy burden of taxation and the general rise in price levels industry was faced with grave problems in financing the maintenance of operations. The question of incentive was therefore of importance.

Although the average level of demand for electricity was rising sharply the dominant problem was that of the peak load. This was more serious than at any time since the war, and in that period the gap between demand and supply had steadily widened. This was indeed a major threat to the prospect of increasing productivity, and so far as could be seen it was likely to cause more dislocation in industry during the coming winter than shortages of solid fuel. Industry looked with anxious expectation to domestic and commercial consumers to make the highest practicable contribution to offsetting the effect on production by curtailing their own consumption even at considerable hardship. It was an ironic thought that tariffs and charges schemes for those consumers, devised in days when the aim was to promote increased consumption of electricity, remained in force and so served to aggravate the critical situation. While there was every sympathy for the convenience and utility of electrical appliances for the home, further developments in this direction should not be encouraged to the detriment of power supply in industry.

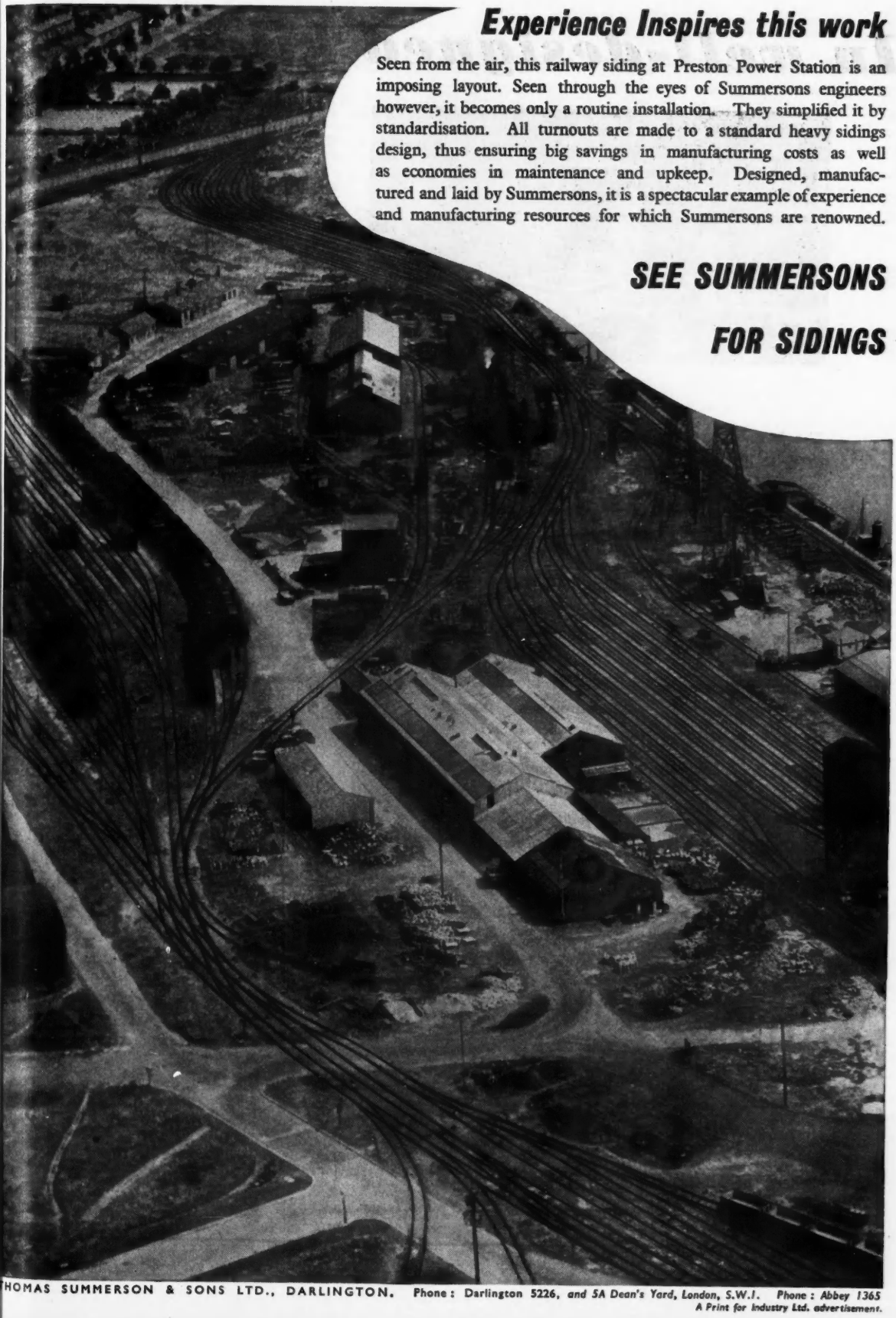
In the long term the only solution—as with coal—was increased supply. Nothing could be more frustrating to industrial development than recurring crises and continual calls for emergency measures. He believed that this constant diversion of thought and energy was one of the principal reasons why insufficient attention had been given to a long term national fuel policy.

SUMMING-UP—WITH RESOLUTIONS

THE various views put forward at the conference, and their implications, were summed-up by Mr. W. L. BOON, O.B.E., who, at the outset, referred to the 1946 conference on fuel and asked whether we had done anything to help matters during the intervening five years. At the present conference they had been more positive—but they had gained only in arriving at a clearer conception of the problems involved; and the fact stood out that the position today in regard to fuel was worse than in 1947, infinitely more serious. The situation during the coming decade would be one of grave difficulty. One of the points which had emerged from the conference was that the fundamental issues of the problem had never been faced; and it was essential that they should be faced. As example, were the coal forecasts of the N.C.B. adequate to meet the needs? He suggested that there was a gross deficiency in the target figure, which, he suggested, was short by 40 mill. tons at least. Why were they afraid of facing a bigger target than that put forward by the N.C.B. He felt that the country should be told what was an adequate target and how such a target could be achieved. That was a resolution which should go forward from the conference.

Then. did they see any co-ordination of policy between the gas industry and the electricity industry, both nationalised and each working, presumably, not in its own interests, but in those of the nation? They had had two addresses, one from the electrical side, one from the gas side. The case had been put for each industry, and he thought that gas had emerged a winner. But there remained the same high walls as hitherto surrounding each industry. He would say that electricity should not be sold for all purposes in all circumstances, which was the state of affairs today. The electricity industry was still pursuing the space heating load. This was quite wrong. The heating load belonged to gas and solid fuel, and they must put a stop to the use of electricity for space heating. A resolution covering conservation on these lines should be framed.

He turned now to the domestic coke consumer, and it had been said that he was being 'slightly denuded' of coke supplies by the gas industry owing to the use of coke for water gas manufacture. The domestic field was certainly being denuded of solid fuel, and hence more gas and more electricity were being used. The gas industry was departing from its



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C.E.A. CONFERENCE

purpose as a two-fuel industry and was considering itself as a complete gasification industry. This again was wrong. The gas industry was asking for a greater supply of coking coals and was denuding the domestic coke market. In the meantime would-be coke consumers were burning coking coals.

Industry could not, of course, develop without a proper supply of power, and now they had a situation, due to the rearmament programme, when the Ministry of Supply was pressing industrialists for output—not for fuel saving. It could hardly be said that the Ministry of Supply and the Ministry of Fuel and Power worked together. Nevertheless, industry must save fuel; the country was 'up against it' in shortage of power, and without power production must cease.

There was one other point he would stress, and that was that steps should be taken to ensure that the co-operation of the British Electricity Authority would be forthcoming in regard to inter-grid linkage of generating plants operated by industry.

NORTH WESTERN METERING CHARGES

IN answer to criticisms of 'metering charges' voiced in parts of the north west recently, the North Western Gas Board issued the following statement on October 3:

Certain misconceptions appear to be fairly widely held concerning 'metering charges,' which are now listed separately in credit consumers' gas bills throughout the north west. The inclusion of metering charges as a separate standardised item in credit consumers' bills has been adopted in consumers' own interests.

Previously 68 of the 103 gas undertakings in the north west used this method of collecting the cost of meters and their maintenance; the remaining 35 included the cost (equivalent to approximately 1d. per therm) in the price charged for gas.

Because this is a directly ascertainable cost, the Board considers that it is unfair, when administratively avoidable, that a credit consumer using, say 200 therms of gas per annum should pay 16s. 8d.—*i.e.*, 1d. per therm—for the meter, while another, using 40 therms, has to pay only 3s. 4d.

Accordingly, when introducing in May its new price structure, which was intended to give the largest measure of standardisation immediately practicable in the charges for the gas service, the Board adopted as standard throughout the area the fixed metering charge, approximating to the actual cost.

The average consumer benefits directly from the new method, as can be easily confirmed by substituting for the fixed metering charge of 8s. a year a charge of 1d. per therm of gas used.

The criticisms which have arisen are due to the mistaken notion that the metering charges are something consumers have not paid before; consumers have in fact always paid these charges, but where they have not been included in gas bills as a separate fixed item (as for example, in Manchester) their impact has varied in direct proportion to the amount of gas consumed.

New I.E.S. President

WITH the opening sessional meeting of the Illuminating Engineering Society on October 9, Mr. J. G. Holmes, A.RC.S., B.SC., F.INST.P., took office as President of the Society for the 1951-52 session. Mr. Holmes has been actively connected with the Society for many years. He is a glass and lighting technologist and became interested in both subjects during his student days when he took optics as his subject for research at London University. He was with Chance Bros. at Smethwick for a number of years and was a senior member of their laboratory staff when he moved to London at the end of the war to join Holophane, Ltd.

Mr. Holmes had published many scientific and technical papers including several in the I.E.S. Transactions and he was awarded the Leon Caster Memorial Premium in 1941. He is chairman of the N.I.C. sub-committee on the colours of light signals and is a prominent member of a number of technical groups and committees. Other activities are indicated by his recent chairmanship of the Physical Society Colour Group and of the London Section of the Society of Glass Technology.

At Birmingham Mr. Holmes served as chairman of the Birmingham Centre of the I.E.S. and he is the first Centre Chairman to become President.

The Council of the Society has awarded this year's Leon Caster Memorial Premium to Mr. H. W. Cumming for his paper on 'The Extension of the gas Arc Condition.' Mr. Cumming is at the research laboratories of Siemens Electric Lamps and Supplies Ltd., Preston.

Celebrations at Home

In the light of its long association and close co-operation with women's organisations, the Newcastle Division of the Northern Gas Board, always alive to the fact that members of these organisations are interested in all events connected with the home and the creation of a contented family life, has extended the scope of its home advisory service activities to include demonstrations giving advice and suggestions on those homely social gatherings celebrating significant events within the family circle, such as silver weddings, comings-of-age engagements, cocktail parties, etc.

A comprehensive list of such demonstrations is included in a brochure entitled 'Celebrating at Home,' offering practical advice to members of women's organisations on table-laying, decorations, menus, invitation cards, together with the actual preparation and cooking of selected dishes.

The brochure says it is felt that many of those homely social gatherings of prewar years to celebrate significant events within the family circle are gradually being lost. There is no doubt that these gatherings, which mean so much to both young and old, have a significant value in binding home-life generally. The war years, rationing, and shortages were the cause of the fall-off of these functions within the home, but with the co-operation of the prominent women's organisations they can be revived.

Lunch-Hour 'Come and Go' Demonstrations

'Come-and-go-as-you-please' proved an attractive slogan for the opening sessions in 'Cookery and the Household Arts' as business girls and others, including even a small number of males, crowded the lunch-hour demonstrations in the Northern Gas Board's lecture theatre at Newcastle.

These demonstrations, which are continuous between 12.30 and 2 p.m., are being held each Tuesday and Thursday during the autumn and winter months. Members of the audience can come and go as their lunch-hour permits and, if desired, may bring their lunch.

Among the subjects covered by the demonstrations are planning meals, correct use of recipes, intelligent cookery, attractive serving, appetising packed meals, cake making and decorating, pastries, savouries, wonder washing, planning your ideal kitchen, etc.

Criticism of 'Cost Plus' System

Criticising the use of the 'price ruling' clause, whereby contracts were executed purely on the basis of cost plus a profit ratio, Mr. Arthur Elliott (member of the National Council of the Purchasing Officers Association) at the Association's conference held recently in Llandudno, expressed the view that nationalised corporations and ministerial departments should provide facilities for industrial consumers to enter into reasonable forward contracts, so that the way was opened to firm price trading, leading to greater all round efficiency and higher production at less cost.

He said that if firm prices were quoted the need for price control orders would in many cases be obviated, and black market trading would not be able to thrive. It was axiomatic that greater efficiency was obtained if a profit was hard to come by; under the price ruling clause a profit was too easily obtained.

Imports of Coal Tar Pitch into France now require only an ordinary licence, which will be granted automatically and without any quantity restriction for purchase from countries belonging to the O.E.E.C., provided the importers obtain a certificate from the Mining and Steel Board, or from the Board for Chemical Industries, that they are entitled to use this commodity.

Book Reviews

THE PREPARATION OF TARMACADAM

TARMACADAM is a generic term covering a range of aggregates coated with tar which, when laid in one, two, or more courses (on prepared foundations) and consolidated either by rolling or tamping, forms a stable roadway capable of carrying traffic. Whichever grade of tarmacadam is required it must be manufactured under controlled conditions in a plant expressly designed for the purpose.

With a view to supplementing the existing specifications for the various groups of tarmacadam, the British Road Tar Association has published a booklet entitled *The Preparation of Tarmacadam*, which will be of assistance to students, users, and manufacturers in describing the essential forms of control required to produce material of consistent quality.

The first section of the booklet is devoted to aggregate (natural and artificial), their grading, drying, screening, and batching. This is followed by a section on the preparation of the tar binder in accordance with the particular application—for example, tar containing the highest proportion of lower boiling oils is more suitable for surface dressing or base courses, whereas tar containing a lower proportion of the lower boiling oils matures more slowly and is more suitable for wearing courses. The importance of correct heating and methods of heating—both vital factors in the production of a satisfactory tarmacadam—receive due attention, while the final process of mixing brings this instructive booklet to a close. The text is supported by a number of interesting illustrations of typical aggregates and various plant and equipment relevant to the processes discussed.

COKE OVEN MANAGERS' YEAR BOOK

THE 32nd edition of the Coke Oven Managers' Association *Year Book*, published for the Association by Benn Brothers, Ltd., continues the record of achievement and progress of the British coking industry, which has been largely expanded and developed during the lifetime of the Association, which now has a membership of 510. The *Year Book* consists in the main of the transactions of the Association and its district sections, and also includes an up-to-date list of members, details of the educational facilities open to entrants to the coking profession, and a full list of coking plants in Great Britain. After a lapse of 10 years it has also been found possible in the 1951 edition to renew the publication of the lists of coking plants outside the United Kingdom.

The annual circulation of the *Year Book* continues to increase. The Editorial Committee states in a preface that there is a world-wide demand for the book, which has become established as a record of practical value to all interested in the treatment of coal and the recovery and use of coke and by-products.

HEATING AND VENTILATING YEAR BOOK

THE fifth issue of the *Year Book* of the Heating and Ventilating Industry, published by Technitrade Journals, 8, Southampton Row, W.C.1, in collaboration with the Association of Heating, Ventilating, and Domestic Engineering Employers, is, like its predecessors, a useful guide to an important and expanding industry. Its purpose is to provide in one compact volume a wide collection of technical, contractual, and other trade information for the benefit of architects, consulting engineers, surveyors, and others who are in close touch with heating and ventilating contractors.

Mr. J. W. Cooling, President of the Employers' Association, in a foreword to what is described as the Festival of Britain issue of the *Year Book*, refers to the visit of the International Union of Associations of Central Heating Contractors, who held their annual conference here earlier in the year, and commends the *Year Book* as an indication to the rest of the world of the progress made in this country in recovery after the war years.

In addition to a series of articles on various aspects of heating and ventilation, the publication contains an up-to-date list of heating and ventilating literature, a buyers' guide, index to trade names, manufacturers' addresses and a full list of technical and trade organisations.

S.I.M.A. DIRECTORY AND HANDBOOK

MODERN science has its roots in measurements and is thus distinguished from the medieval theorising which preceded it. Thus writes Sir Ben Lockspeiser, K.B.E., F.R.S., Secretary of the Department of Scientific and Industrial Research, in a foreword to the 1951 *Handbook* of the Scientific Instrument Manufacturers' Association of Great Britain. The S.I.M.A. comprises a large industry with an annual output exceeding £50 mill. in the home and export markets, and the compilation of this *Handbook* is itself testimony to its variety, vigour, and vitality.

In addition to information on the background of the British scientific instrument industry and many of its ramifications, contained in an illustrated 'art' section, the principal features of this volume are a directory of 104 British instrument manufacturers who are members of the Association and an index giving the sources in this country of some 2,500 scientific instruments to enable users to locate instantly the manufacturers of any industrial, research, medical, or educational instruments. The fact that the index is 20% larger than that of the previous 1947 edition is a measure of the increasing production of this important industry.

Copies of the *Handbook* can be obtained by enquiry at the Association's headquarters at 20, Queen Anne Street, London, W.1. It will form a valuable addition to the gas industry's reference libraries inasmuch as the industry is a large user of many of the instruments covered.

GRAND ALLIANCE

WE have received from General Gas Appliances, one of the 22 subsidiaries of Allied Ironfounders, Ltd., a copy of *Grand Alliance*, dealing with the history of the parent company which, with that of its forerunners, has been traced back over a period of 250 years. The facile pen of the author, Basil H. Tripp, a friend of ours of many years' standing, has been wielded to good effect in making the three chief points that seem to justify even so modest an account of so momentous a business—namely, the faith of a great enterprise in the future of British industry at a time of deep political and economic anxiety; the confidence, born of a clear conscience, of the enterprise in itself; and the absolute as well as the relative social value of a progressive industrial undertaking.

Much of the early history of the original Coalbrookdale Company is taken from a paper on '250 Years of Ironfounding' which Dr. A. Raistrick read before a sales convention of Allied Ironfounders, Ltd., last November. The founder was born in 1678, and by 1851 the Coalbrookdale Company was famed for its foundry products. It was not, however, until as recently as 1929 that Allied Ironfounders, Ltd., was formed. From 1939 the companies were absorbed into the war effort, and the succeeding years have been a period of progress and achievement.

Every director of Allied Ironfounders, Ltd., today is a practical engineer or ironfounder, and with two exceptions all are full-time officials of the Company. Each is a member of the board or boards of one or more of the subsidiary companies. The foundries are grouped into two broad divisions, Scottish and English. Some members of the parent board and some directors of the subsidiaries sit on the respective boards of the two groupings. Detailed touch is kept with all the works and affairs of the whole business collectively through a simple committee system. In conclusion the author describes the organisation as a grand alliance of firms banded together in technical integrity, good taste, and with vast resources purposefully arrayed. Its directors, staff, and working folk serve it with pride.

The British Standards Institution has recently published 'Fireclay Refractories (Bricks and Shapes) for Use in the Petroleum Industry.' Although prepared specifically for the petroleum industry, it is expected that the provisions of this specification will be found equally useful to many other users of refractory products. Copies of this standard (B.S. 1758 : 1951) may be obtained from the British Standards Institution, Sales Department, 24, Victoria Street, London, S.W.1, price 2s., post free.

Junior Association Activities

MIDLAND

Session Opens in Birmingham

THE Midland Junior Gas Association opened the new session with a meeting held in the Staff Mess Room at Birmingham, on October 9. Mr. J. Palser (Birmingham), the retiring President, occupied the chair during the first part of the meeting, later handing over his badge of office to the incoming President, Mr. R. B. Watkins (Coventry).

The meeting commenced with the presentation of the 'Milbourne' medal to Mr. J. Foxton, in recognition of his paper 'Thirty Years of Carbonisation,' and Mr. Palser commented briefly on the symposium of short papers which would again be presented at the annual meeting of the Institution of Gas Engineers this year. 'We in the Midlands,' said Mr. Palser 'are very proud that of the three papers presented at the last symposium, two came from this area—namely, those by Messrs. J. F. Waight and B. H. Cunningworth.'

Making the concluding remarks of his term of office, Mr. Palser extended his thanks to the West Midlands Gas Board, members of the Council, and all members of the Association for their generous support during the 45th session of the Midland Juniors. In handing over his badge of office to Mr. R. B. Watkins, he was transferring the office to a friend whom he had known since 1917 and who, he felt sure, would keep the principles of the Junior movement foremost in his mind and make the Midland Junior Gas Association the envy of others throughout the country.

Responding, Mr. Watkins referred to the high regard in which Mr. Palser was held by his colleagues and friends, and remarked that during his term of office the Association had gone from strength to strength.

The new President then read his address, published on p. 174.

The thanks of those present, who included a large number of visitors, was expressed by Mr. D. J. Ward (Birmingham) and Mr. J. A. Tomes (Stourbridge), respectively Senior and Junior Vice-President.

YORKSHIRE

Annual General Meeting at Leeds

THERE was a large attendance of members at the annual general meeting of the Yorkshire Junior Gas Association, held at the Metropole Hotel, Leeds, on October 6, when Dr. R. S. Edwards, Chairman of the North Eastern Gas Board, gave an address on 'Large Scale Organisation in the Gas Industry' (reported in the *Journal* of October 10, pp. 93-100).

After extending a welcome to the guests and new members, the President, Mr. S. DAVIES, referred to the death of Mr. R. N. WEBB, who was a faithful and highly respected member of the Association. For many years Mr. Webb took a keen interest in the activities of the Association, especially the younger members, to whom he was an inspiration.

Mr. Davies then referred to the award made in the recent Birthday Honours to one of their members, Mr. A. WYLIE, a Past-President in 1938-40. On behalf of members he extended congratulations to Mr. Wylie on being awarded the M.B.E. for services rendered to the industry.

Mr. WYLIE returned thanks for the congratulations expressed by the members.

Mr. G. E. BANKS, Hon. Secretary, presented the annual report and statement of accounts. The revised rules submitted by the Council were adopted. Presentation of the Clayton Award to Mr. J. Hoskins, Leeds, was made by Mr. Hartley (Messrs. Clayton, Sons & Co., Ltd.) and the Webb Award was presented to Mr. L. SHOWLER (York) by Mr. R. Webb.

Mr. H. DEARNLEY (Leeds) was inducted President of the Association for 1951-52, and later presented a replica of the badge of office to Mr. Davies, the retiring President.

A vote of thanks to the retiring President, officers, and members of the Council was moved by Mr. R. HOWARTH and seconded by Mr. O. G. A. HOFFMAN.

In calling on Dr. Edwards to address the meeting, Mr. Dearnley thanked him for the interest he showed in the Yorkshire Juniors; he was sure with his continued support the Association would progress.

A vote of thanks to Dr. Edwards was moved by Mr. C. G. BROOM and seconded by Mr. A. COLE.

It was intimated that Mr. FIRTH would give the Award for the Short Paper. Mr. FIRTH said it gave him great pleasure to carry on the Award.

Mr. Webb was always out to encourage the Juniors, and realised the importance of a platform. He had therefore great pleasure in carrying on the work of Mr. Webb.

The following Officers were elected:—*Junior Vice President:* A. Cole, Huddersfield. *Members of Council:* F. Roberts (Bradford), C. E. Burkett (Harrogate), A. J. Winter (Leeds), J. E. Brandon (Sheffield) (one year). *Education Committee:* A. Cole (Huddersfield), A. W. Field (Sheffield), R. E. White (Leeds), A. Wilkinson (Huddersfield).

LONDON AND SOUTHERN

Jubilee Year

THE fiftieth session of the London and Southern Junior Gas Association opened on October 12 at the Lecture Theatre of the North Thames Gas Board's showrooms in Edgware Road, London, W.2. The new President, Mr. J. D. C. WOODALL, B.A., M.INST.GAS E., M.INST.F. (Manager of the Maidstone Group, South Eastern Gas Board), occupied the chair.

A pleasing ceremony was the presentation by Mr. WOODALL on behalf of the members of a silver salver to the retiring president, Mr. T. V. Garrud, as a memento of his year of office. In making the presentation, Mr. Woodall observed that Mr. Garrud had had a very hard year. He was appointed to a senior position with the North Thames Gas Board which involved him in a great deal of work, but in no sense had he neglected their Association. In the whole history of the Association they had never had a more charming, tactful and friendly president, and Mr. Woodall was only sorry that he could not be their president during the jubilee year. Nevertheless, he was fortunate to have Mr. Garrud to guide him during this session.

Mr. T. V. GARRUD, in acknowledging the presentation, commented that he had done nothing more than any of his predecessors had done; but he had been inspired by the ideal of the junior movement and the great good it performed in the gas industry. Through all the years he had been a member of the Association he had not only learnt a great deal, but it had brought him into contact with many friends. It knitted them in a spirit of comradeship and kept them in touch with each other's jobs. He wished Mr. Woodall every possible happiness during his year and the Association continued success. It was, said Mr. Garrud, very fitting that one bearing the name of Woodall should be their president in this their jubilee year.

The President reminded members of the visit on October 27 to the Waddon gasworks (Croydon) of the South Eastern Gas Board and also of the next ordinary meeting on November 2, which would be a short paper meeting. He also announced that the junior associations had again been invited to submit contributions to the symposium of short papers to be presented at the annual meeting of the Institution of Gas Engineers. Members of their association wishing to do so should communicate with the hon. secretary not later than November 17.

A paper was then read by Mr. K. L. Clark, London Manager to W. J. Jenkins & Co., Ltd., entitled 'Horizontal Retort Stoking Machine Operation,' which was followed by a lengthy discussion.

R. B. WATKINS

Industrial Gas Officer, Warwickshire Division, of the West Midlands Gas Board discusses

Presidential Address to the Midland Junior Gas Association, October 9.

COVENTRY'S INDUSTRIAL LOAD

THE first gasworks was established in Coventry in the year 1820. The Coventry Gas Act, passed in the year 1856, transferred the gas undertaking to a new Company with largely extended powers authorising, among other things, the supply to a far greater area. It is on record that about this time approximately 400 gas engines were in regular use, superseding steam as a motive power.

In the year 1884 the Corporation of Coventry purchased the gas undertaking at an agreed price of £170,354. The annual gas output from the works, which was still on the original site in Gas Street, was then 185 mill. cu.ft. It is interesting to note that today one company alone is taking approximately three times that volume. The average price of gas sold that year was 2s. 11½d. per thousand cu.ft.

Just on the turn of the century it was decided by the Corporation that the Gas Street site was inadequate for further developments. The Foleshill site was acquired and manufacture was commenced there in 1908. The price of gas then ruling averaged 2s. 3d. per thousand cu.ft., and sales had reached the 800 mill. cu.ft. mark. The manufacture of gas at Gas Street ceased in 1909.

Through the Years

Travelling through the years we find that the demand for gas during the 1914-18 war exceeded all expectations, and by 1918 the sales were in excess of 1,800 mill. cu.ft., over 50% of this being taken by industry. In 1927 the Corporation purchased the Kenilworth Gas Company, and in 1930 the Bedworth Gas and Coke Company, making a total authorised area of 121 sq. miles. Just prior to nationalisation the area of supply was 126 sq. miles, excluding Nuneaton, which had by then closed as a manufacturing station and was taking all supplies from Coventry.

During the years between the wars manufacturing plant was continually extended, and in the year 1939, when sales exceeded 3,000 mill. cu.ft., it was possible to meet the most phenomenal demands made on the manufacturing capacity. The peak output during the war period was in the year ended March, 1944, when the total sales were 4,213 mill. cu.ft. Of this figure approximately 60% was sold for industrial purposes.

At the end of hostilities the demand for gas gradually diminished during the change-over from war to peace time production, and the sales dropped in the year ended March, 1946, to 3,700 mill. cu.ft. This output has rapidly grown to a record for the year ended March, 1951, when a figure of gas sold to the Coventry area alone was very nearly 5,000 mill. cu.ft.

It is very difficult to say exactly when gas was first used for purposes other than lighting.

I have mentioned previously that it was used for motive power nearly a 100 years ago, but to my knowledge no definite information is available as to when it was first used as a heating medium. However, I have been fortunate to borrow a book entitled *Coal Gas as a Fuel*, a concise guide to fitters and users by Thomas Fletcher of Fletcher Russell and Co., Ltd., Warrington. This book was published in the year 1898, and was the fifth edition. It reads as follows: 'That five editions of a purely technical work addressed to a limited class should be required within six years is unusual.' It is, therefore, definitely placed on record that the book was originally published in the year 1892, which establishes that gas was being used for industrial purposes towards the end of the nineteenth century.

The index of this book states that the contents deal with many aspects of gas which are in continual use at the present time. Such matters as automatic water heating, bacon drying, bakers' ovens, brazing ovens, blow pipes, etc., are explained in detail, and it can be placed on record that the illustrations of blow pipes and soldering iron stoves shown in this book are identical with those being used to-day. Another paragraph deals with products of combustion, which were as foremost in the minds of our predecessors as they are in ours at the present time.

When it was realised by the engineers of those days that the scope for gas for industrial purposes would eventually become a major feature in future development, a close liaison was established between Coventry and other undertakings and the Birmingham Industrial Research Laboratories, originally known as the High Pressure Gas Laboratory, and contact between several well-known firms on the Walter gas-sealed tube furnace had taken place in the very early days of the 1914-18 war. I can recall, during my early days at Birmingham, many Coventry manufacturers calling upon the facilities offered for research and development of gas for industrial heating projects.

A Town of Specialised Industry

Coventry has always been a town of specialised industry and cannot in any way be compared with Birmingham with its thousand and one trades. Actually, the City has passed through very few phases of trade cycles. First came weaving and the City was known for its famous blue dye, which gives rise to the saying 'True as Coventry Blue.' The next important trade was watches. Both these industries are still carried on in Coventry, but in no case is there a large demand for gas in the process of manufacture. There followed bicycles, tricycles, etc., and the name of Coventry was again in the forefront of the world for some of its famous machines. Gas is used to-day in this industry, first for brazing by the use of the well known blow pipe, and by liquid brazing bath for the construction of the framework; and secondly, through the use of box ovens or japanning stoves for paint drying. The design of this stove has led through the years to the conveyor oven, and this type of appliance is extensively in use to-day, not only in the cycle and motor trade, but in many other similar industries.

Following the cycle trade Coventry manufacturers turned to the motor car industry and today no city in the world of comparable size, turns out so many motor vehicles. Gas is used in multiplicity of applications for the manufacture of motor cars, such as heat treatment of component parts, plating, bonderising, body filling, paint drying, etc. The demand for the latter application is continually being extended, and we have applications on hand at the moment for

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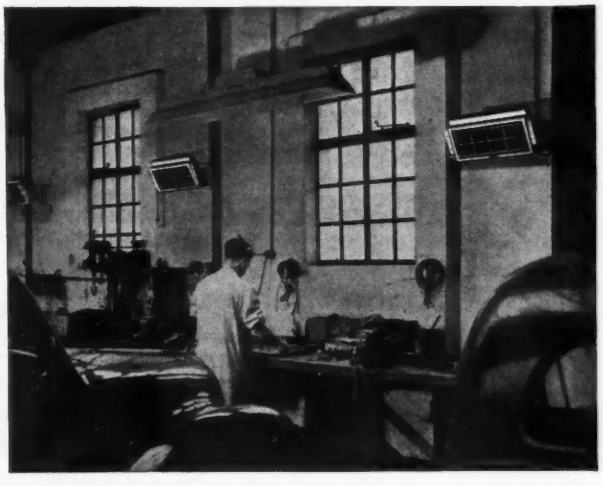

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Announcement

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SECTIONS 2 and 5 are now available. Sections 3 and 10 will be ready shortly; other sections are well in hand. Pleaase watch this advertisement for further progress news.

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the conversion of conveyor ovens which are at present heated by high pressure hot water or other means, as the new synthetic paint now being used calls for a higher temperature, which cannot be obtained economically by other means than gas.

Many motor car manufacturers over the last 20 years have extended their activities to cover aircraft manufacture, and in all these works gas is used to a very large extent, covering similar processes to those in the car industry.

As an illustration of the varied industries carried on in the city, table 1 shows a schedule of actual gas consumptions taken by the different classes of industry, for a period of 12 months ended October, 1947, from which it will be observed that practically half the industrial load for that particular year was used exclusively by motor car manufacturers.

TABLE I.

CITY OF COVENTRY GAS DEPARTMENT
ANALYSIS OF INDUSTRIAL CONSUMPTION

	Industry	Consumption Thou. Cu. Ft.
1.	Sundries (including hotels, restaurants, sheet metal workers, etc.)	101,766
2.	Accessories (Car spare parts, wheels, radiators, nuts and bolts, etc.)	271,330
3.	Motor cars, motor cycles, etc.	610,698
4.	Cycles	16,347
5.	Textiles	9,924
6.	Castings and Forgings (including light alloys)...	176,568
7.	Aircraft	47,114
8.	Electrical (including telephones, wireless, etc.)...	39,709
9.	General Engineers (including component parts, machine tools, etc.)	176,686
	TOTAL	1,450,142

October 21, 1947.

Limitations

What are the limitations of an industrial department? What sphere does it cover? The industrial load is normally taken as that used for manufacturing purposes, steam raising, etc. In Coventry the Industrial Department covers, in addition to these, heat treatment service, commercial catering, space heating, etc.; in other words, anything that is not purely domestic. There are several debatable points on this subject as to the category in which to place such consumers as fish fryers, milk bars, heating of offices, hotels, etc. However, a decision was made many years ago that the Industrial Department should be solely responsible for non-domestic consumers, and this has worked very satisfactorily.

The first industrial engineer was appointed to the Coventry undertaking in 1930. When I was appointed in 1939 there was then in existence an organisation with records of every factory and details of plant installed. The major work involved in those days was purely of an advisory capacity, and the very close co-operation with the Birmingham undertaking was still maintained.

With war imminent soon after my arrival in Coventry, it gave me an excellent opportunity of considerably extending the work of the Industrial Department, and I was able not only to continue the good work already done, but actually to organise a complete Sales and Service Department, thereby both giving advice as to the best type of apparatus for a particular job and creating the sale of the appliance, and also introducing a service scheme for the repair and maintenance of existing equipment. In some instances where it was not possible to obtain specially designed equipment from the manufacturers, the undertaking took on the job of building and installing the plant.

In the early days of 1940, permission was given by the Gas Committee to establish commercial heat treatment shops. It was decided, due to the possibility of air raids, that these should be in a safe zone and they were, therefore, established at premises existing at the Kenilworth works. This project has proved its worth many times over.

The Industrial Department is today housed in its own building adjacent to the main offices and comprises heat treatment shops, where work is carried out for the various manufacturers within the area, and a commercial showroom where a complete range of catering, fish frying, baking and space heating equipment is displayed. The display in this showroom is altered from time to time and has proved a great asset to the people who require advice and information on new or replacement equipment. Stores of industrial equipment, burners, refractory material, etc., are also kept in these premises.

The department has been made over the last few years as near as possible self-contained. For instance, on an enquiry being received for any additional load or replacement, the whole matter is investigated by a member of the Industrial Department's staff, and the total gas requirements are ascertained. When this information has been obtained, consultation is held with the distribution department to make sure that adequate supplies are available in the vicinity. The size of meter required is passed on to the distribution engineer, and a quotation is then forwarded by his department to the prospective consumer for the necessary service and meter fixing.

After these points have been settled, the Industrial Department is then solely responsible for all supplies from the outlet side of the meter. Quotations are submitted to the consumer for apparatus covering whatever purpose or process he has in mind, and the installation of the necessary gas supplies is covered in these prices.

If instructions are received to proceed with the work, it is executed by fitters and other specialised craftsmen under the direct control of the Industrial Department. When the installation is completed, the technical assistant who was originally responsible for the enquiry, inspects and tests all pieces of apparatus and pipe work, and does not leave the job until everything is working to the consumer's entire satisfaction.

For many years I have endeavoured to make each member of the staff particularly responsible for one class of consumer, but unfortunately, due to many changes in personnel, particularly in Coventry since the end of the war, it has not always been practicable to carry this out. The idea behind this is that, although it is not my intention to tie an individual down to, say, the sale of catering equipment, it is a great advantage to have one man specialising in this class of work. He in his turn can be of assistance to other members of the staff when difficulties arise.

Liaison

The general object of each member of the industrial staff is that he will be the liaison officer between the gas undertaking and a particular factory, whereby he gains a general knowledge of the multiplicity of gas usages in that works. He is well known to the works engineer and creates the impression that he is at their service whenever problems relating to the gas industry occur. If, however, some problem arises in which he is not particularly specialised, he can immediately call in the services of his colleague, who can help in some particular sphere.

This method of personal contact is more valuable now than at any other time. We are suffering in this area, along with many others, from shortage of supplies, and on many occasions of late it has been necessary to refuse additional meter capacity. In such circumstances it is always much better to 'know your man,' as by this relationship and the right approach we have been able to prevent possible unpleasant repercussions.

Unfortunately there are very few records available of the early activities of the Industrial Department. The German Luftwaffe paid a visit to Coventry on November 14, 1940, and completely destroyed the greater part of the records existing before that date. It is, therefore, impossible for me to quote authentic figures prior to that time. It is well-known by now that gas was extensively used in various manufacturing processes in many factories throughout the city in such

operations as general heat treatment, steam raising, canteens and the running in of internal combustion engines, prior to road test.

The use of gas for all these purposes has been multiplied many times over the last few years. Several extensions to existing equipment have been installed, and complete new plants which were built during the early days of the war, have since that date been further increased in capacity.

One very interesting installation during the war period, following the early pioneer work carried out in conjunction with the Birmingham undertaking, was the development of engine testing using gas in place of petrol. At one works where aero engines were being manufactured, a 60,000 cu.ft. per hour meter was installed exclusively for running in these engines, we being informed at the time that gas was preferred for this purpose owing to the fact that if petrol was used in the early stages, it was liable to wash the cylinder walls of all lubricants, thereby causing considerable damage.

Gas is still being used in several factories for the same purpose, and of recent days, owing to the shortage of supplies, further demands have had to be refused—these demands undoubtedly being made because of the recent increase in the price of petrol.

Shadow Factories

Other interesting installations were three shadow factories built completely on new sites in the early days of 1940, each plant having its own heat treatment department. To each of these factories it was necessary for the undertaking to run special mains and install 35,000 cu.ft. meters. At many periods during the war these meters were being run for several hours on end at their full capacity. One of these factories has now completely closed and very little gas is being used. At another a considerable amount of alteration to plant and equipment has taken place, but the actual gas load has increased since the peak period of 1944. In the third factory we have now installed a total meter capacity of 95,000 cu.ft. per hour. This is the company to which I referred earlier, and the total amount of gas taken during the 12 months ended March 31, 1951, together with their two other sites, was in excess of 450 mill. cu.ft. These three factories controlled by the Standard Motor Co., Ltd., are solely engaged in the manufacture of the Standard and Triumph range of cars, and the Ferguson tractor.

All information relevant to the various factories throughout the area is tabulated on a special card index system. Through this tabulated information it is always possible to produce evidence, which is occasionally called for, proving the quantity of gas taken from time to time by various factories and potential loads for future years.

Among our largest consumers are Messrs. Humber, Ltd. (formerly Rootes Securities, Ltd.), who controlled two factories on behalf of the Ministry of Aircraft Production during the war period. The No. 1 factory, which commenced operations in April, 1938, maintained a fairly consistent load throughout the whole of the period up to 1945. Since the end of the war this factory has been taken over for the production of commercial vehicles and the consumption has fallen off in view of the fact that this particular factory is now used only for assembly. The No. 2 factory which was open for production in March, 1940, created a terrific demand on our supplies and reached a peak monthly consumption in November, 1941, when over 10 mill. cu.ft. of gas were taken. Peak production was maintained until early 1944, and from that time onwards the load gradually diminished until the end of hostilities when the factory was turned over to the final assembly of the range of Humber and Hillman cars. Heat treatment shops were retained and a considerable amount of additional plant installed on the production line, using gas as a fuel for paint drying, etc., and the monthly consumption has again exceeded the war-time peak and reached an average figure of 11½ mill. cu.ft.

50% Demand

The demand for gas for industrial purposes has gradually increased until an average figure of 50% has been taken over the past few years. There is no doubt that in the future the gas industry will rely more and more on its industrial load. To maintain this load we must make sure that highest efficiency of plant is maintained, that the right type of apparatus is always used, and that the personnel attached to the Industrial Department must be fully trained and be able to meet all eventualities.

The biggest problem facing us today is to encourage the right type of youth to come into the industry, not only as gas engineers, but as heat specialists and metallurgists. This problem must be solved in the very near future, for it is only by this means that we can really rely on further developments.

I should like to thank Mr. A. Allen, Divisional Manager, Warwickshire Division, Mr. A. E. West, Engineer and Manager, Coventry District, the Standard Motor Co., Ltd., and the Humber Co., Ltd., for permission to publish the figures given.

COMPANY APPOINTMENTS

Mr. HYMAN STONE, LL.M., has been appointed a Director of Benzol and By-Products, Ltd., in succession to the late Sir Alan Hutchings.

* * *

Mr. S. M. LAWRENCE has been appointed Assistant Sales Manager, Unwrought and Special Products, of the British Aluminium Co., Ltd., in place of Mr. R. M. WARRINGTON, who will relinquish his appointment with the Company on October 31. Mr. LAWRENCE will be responsible, under the Home Sales Manager, for the sales routine for powder and paste; unwrought products (slabs, wirebars, virgin and secondary pure and alloy ingots, etc.); and special products (alumina, hydrate and red oxide). Mr. O. M. BRUCE PAYNE has taken over responsibility for the Technical Service Section of Development Department, under the Development Manager, in place of Mr. Lawrence.

The following Directors of William Sugg & Co., Ltd., have been appointed to the Board of Cowper Penfold & Co., Ltd.: Mr. W. T. MATTOCK, Mr. P. C. SUGG, B.SC.ENG., A.C.G.I., M.INST.GAS E., F.I.E.S., and Mr. R. W. Young, F.C.A., who is also Chairman, vice Mr. C. C. PENFOLD who continues as Managing Director.

* * *

Mr. W. B. ROBSON, A.M.I.E.E., has relinquished his position as head of publicity and order departments with Brookhirst Switchgear, Ltd., Chester, upon his appointment as General Manager of Cantie Switches, Ltd., Bromborough, Cheshire. He had his early training at Reyrolle and Co., Ltd., Hebburn, and, following appointments with the English Electric Co., Ltd., and Electroflo Meters Co., Ltd., he joined Brookhirst Switchgear, Ltd., in 1938. Between 1939 and 1946 Mr. Robson was personal assistant to the managing directors, manager of branch works, and subsequently assistant works manager.

Publications Received

We acknowledge with thanks the following:—

Air Control Installations, Ltd., publication G.513, dealing with dust control in foundries. Particular reference is made to 'Rotoclones.'

Autocontrol Boilers, Ltd., for the latest brochure dealing with the new range of boilers. This book, the first to be issued since the war, will shortly be distributed to gas undertakings.

Quasi-Arc Co., Ltd., for their catalogue listing and illustrating the entire range of electrodes, plant and accessories which they manufacture for automatic and manual arc welding

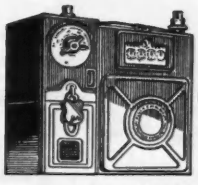
Rheostatic Co., Ltd., for their list No. 140, which illustrates and describes the 'Satchwell' range of modulating valves. This range is all electric in operation and provide a two-rate response of the valve to a change in demand by the controlling thermostat.

MOMENTOUS *Measures*

A DRASTIC MEASURE No. 12

November Fifth comes round again
with squibs and jubilation,
To mark Guy Fawkes' protest against
oppression and taxation.
We wonder what he'd do today
if he'd *OUR* Income Tax to pay.

The abortive Gunpowder Plot was a drastic measure aimed at those in Authority with the hope of removing injustices. The A & M Gas Meter is a modern measure designed to remove all complaints between the Gas Supplier and his consumers.



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"We are pleased with results obtained after using ONX Super '83' Brand.
"Our settings were very bad, with large cracks in retorts, and portions of wall actually collapsed.
"Now, six months after repairing 28 retorts they appear as sound as ever; we anticipate the life of the settings will be prolonged."
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PUBLISHERS' NOTICE

The "Gas Journal" is published every Wednesday, price 1/3d.; by post 1/5d.

Subscription Rates : Home and Empire :- 52/- per annum ; Foreign :- 60/- per annum. (Both payable in advance.) A copy of the "Gas Journal" Calendar & Directory is presented each year to continuous subscribers.

Classified Advertisements : All small classified advertisements are charged at 1/9 per line (approx. 7 words) - minimum charge 10/6. A Box Number address occupies 2 lines, and a further 6d. is charged towards cost of postage on replies. Copy must be received by first post on Monday to ensure insertion in that week's Journal.

Displayed Advertisements : Rates obtainable on application to the Business Manager. Change of copy for displayed spaces must be received 14 days prior to publication if proofs are required. Type area of inside pages 10" deep x 7" wide ; block screen 120.

BUSINESS MANAGER : S. T. CULLEN

MIDLANDS OFFICE : 10, Union Street, Birmingham.

NORTHERN MANAGER : W. Q. Foster, 33, St. Helens Road, Harrogate. 'Phone : Harrogate 84291.

WALTER KING, LTD., 11, Bolt Court, Fleet Street, London, E.C.4.

Telephone : CENtral 2236-7. Telegrams : Gasking, Fleet, London.

APPOINTMENTS VACANT

HARDMAN & HOLDEN Ltd., invite applications for a post of TECHNICAL REPRESENTATIVE in the Fresh Oxide of Iron section of their business. The post is permanent with superannuation and offers considerable scope. Applications in writing, giving full details of age, experience and present salary, should be addressed to the Secretary, Manox House, Miles Platting, Manchester, 10.

EAST MIDLANDS GAS BOARD

NOTTS. & DERBY DIVISION.
ILKESTON UNDERTAKING.
TECHNICAL ASSISTANT.

APPLICATIONS are invited for the position of TECHNICAL ASSISTANT in the above Undertaking.

Applicants should hold the Higher Grade Certificate in Gas Engineering (Manufacture), should have a sound experience in Works operation, the control of W.D. Vertical Retorts, laboratory tests, and be capable of making simple drawings.

The salary will be in accordance with A.P.T. Grade VII, £500/580 per annum, and initial placing on the scale will be according to age and experience.

The post is superannuable and the successful candidate may be required to undertake a medical examination.

Applications stating age and experience, and giving full particulars of training, qualifications, together with the names of two referees, should be addressed to the undersigned for receipt within fourteen days of the appearance of this notice.

K. L. PEARCE,
Divisional General Manager.

East Midlands Gas Board,
Notts. & Derby Division,
Friar Gate,
Derby.

WHESSOE LIMITED have the following vacancies in their Erection Department:—

ASSISTANT PLANT ENGINEER to assist with the purchase, allocation and maintenance of welding plant, mobile cranes, derricks and other erection equipment. Considerable amount of travelling involved, as main activity will be examination of plant at site. Applicants should have sound mechanical maintenance experience, with good technical training.

CONSTRUCTION ENGINEER to supervise the erection of large welded storage tanks, gasholders and large plant installations for both Petroleum and Gas Industries. Site erection experience of this or similar plant is essential, together with appropriate technical qualifications. Considerable amount of travelling involved visiting small sites or alternatively resident on major contracts.

CONSTRUCTION ENGINEER to assist with the organisation and control of site work as above, at Head Office. Appropriate technical qualifications and previous experience as Resident Construction Engineer are essential.

Applications in writing, giving date of birth and setting out full details of qualifications and experience for the above posts, should be addressed to The Secretary, Whessoe Limited, Darlington.

NORTH THAMES GAS BOARD

A GASHOLDER INSPECTOR is required in the Clerk of Works Section of the Chief Engineer's Department. Applicants, who must be physically fit and capable of negotiating heights, should have had experience in gasholder surveys, structural steelwork and general mechanical engineering. The Higher National Certificate standard is desirable, and ability to drive a car would be an advantage. The appointment is of a permanent nature, and pension arrangements will be discussed with short list candidates. Starting salary will be not less than £650 per annum.

Applications, stating age, and giving full particulars, should be sent to the Staff Controller, North Thames Gas Board, 30, Kensington Church Street, London, W.8, quoting reference number 77, to reach him not later than October 31, 1951.

NORTH THAMES GAS BOARD

THE FOLLOWING Drawing Office Staff are required in the CHIEF ENGINEER'S DEPARTMENT.

1. JUNIOR DRAUGHTSMEN (3) at BECKTON, E.6; SLOUGH, BUCKS.; and LEA BRIDGE, E.10. Applicants should preferably have had some experience in the maintenance of gas plant and be conversant with the design of steel structures and lay-out of buildings. Starting salary within the range £295 per annum to £535 per annum, according to age, qualifications and experience.

2. DRAUGHTSMEN (2) at WESTMINSTER.
   (*a*) Experienced in the design, layout and detailing of mechanical handling plant.
   (*b*) Experienced in the design, layout and detailing of any of the following :—Coal Carbonising Plant, Coke Oven Plant, By-Products Plant, Pipe Layouts or Steel Framed Structures.

Applicants should be about 30 years of age. Starting salary within the range £570 per annum to £650 per annum, according to age, qualifications and experience.

All the above appointments are of a permanent nature and pension arrangements will be discussed at interviews. Applications, stating age and full particulars of training and experience, should be sent to the Staff Controller, North Thames Gas Board, 30, Kensington Church St., W. 8, quoting reference number 79.

WALES GAS BOARD

WREXHAM UNDERTAKING.
SALES SUPERINTENDENT.

APPLICATIONS are invited for the appointment of a SALES SUPERINTENDENT at the Wrexham Undertaking of the Board.

Candidates should have had experience of the development of gas sales, the disposal of coke and other products, showroom management and consumer service.

The commencing salary will be within the maximum of Grade A.P.T. VI of the National Salary Scales. Living accommodation will be made available at a reasonable rental.

The appointment will be subject to medical examination and to such superannuation regulations as the Board may adopt.

Applications, giving details of age, qualifications and experience, together with the names of two referees, should be sent to Mr. J. F. Lloyd, Engineer and Manager, Wales Gas Board, Wrexham Undertaking, Rivulet Road, Wrexham, not later than October 22, 1951.

APPLICATIONS are invited for positions on the Technical Staff of West's Gas Improvement Co., Ltd., Manchester, for operational development and research work on carbonizing plant and equipment. Salary commensurate with qualifications and experience. Applicants must be prepared to travel.

WEST MIDLANDS GAS BOARD

BIRMINGHAM DIVISION.
TECHNICAL ASSISTANT—
INDUSTRIAL DEPARTMENT.

APPLICATIONS are invited from suitably qualified persons for the post of TECHNICAL ASSISTANT in the Industrial Department of the Birmingham District.

The salary for the position will be not less than £500 per annum on commencement, rising by annual increments to a maximum of £580 in accordance with Grade VII of the salary scales of the National Joint Council for Gas Staffs.

Candidates must have had experience of Industrial Gas and furnace applications, and qualifications of the Institution of Gas Engineers, Institution of Mechanical Engineers, or the Institute of Fuel will be advantageous.

The successful applicant may be required to pass a medical examination, and to subscribe to such scheme of Superannuation as the Board may, in due course, adopt.

Applications, stating age, training, qualifications and experience, together with the names of two referees, should be addressed to Mr. J. E. Wakeford, Divisional Manager, West Midlands Gas Board, Birmingham District, Gas Offices, Edmund Street, Birmingham, 3, to reach him not later than fourteen days after the appearance of this advertisement. Applicants are requested to quote ref. T.P.3 when replying to this advertisement.

F. H. CURETON,
Secretary.

WEST MIDLANDS GAS BOARD

BIRMINGHAM DIVISION.
DRAUGHTSMEN.

APPLICATIONS are invited for the position of DRAUGHTSMAN (two vacancies) on the staff of the Divisional Engineer, Birmingham.

The salaries for the posts will be not less than £425 per annum on commencement rising by annual increments to a maximm of £505 per annum, in accordance with Grade V of the salary scales of the National Joint Council for Gas Staffs.

Candidates should possess a sound knowledge of general engineering (to Higher National Certificate Standard) with experience in plant lay-out. A knowledge of gas works plant will be an advantage but is not essential.

The successful candidate may be required to pass a medical examination and the appointments are subject to any superannuation scheme that the Board may in due course adopt.

Applications, stating age, qualifications and experience together with the names of two referees, should be addressed to Mr. J. E. Wakeford, Divisional Manager, West Midlands Gas Board, Birmingham Division, Gas Offices, Edmund Street, Birmingham, 3, to reach him not later than fourteen days after the appearance of this advertisement. Applicants are requested to quote ref. T.P.3 when replying to this advertisement.

F. H. CURETON,
Secretary.

(*Classified advertisements continued on Supplement* 4)

APPOINTMENTS VACANT (ctd.)

YOUNG Man or Woman required as an ASSISTANT to Publicity Manager. Writing ability and accuracy in detail work essential. Apply in writing, giving particulars of experience and salary required to: The Personnel Officer, The Woodall-Duckham Company, 63/77, Brompton Road, London, S.W.3.

GAS ENGINEER wanted for Gas Works in Calcutta. Age 35-45. Salary and allowances according to qualifications but not less than the equivalent of £2,000 per annum, plus Provident Fund. Residential accommodation available. Appointment, in first instance, for three to five years. Passage paid. Candidates must be fully qualified Gas Engineers and capable administrators.

Applications, stating full particulars of qualifications, experience, present position, age and whether married or single, to be sent, as soon as possible to: W. A. M. Walker, Broad Street House, 54, Old Broad Street, London, E.C.2.

EASTERN GAS BOARD

CAMBRIDGE DIVISION.

DIVISIONAL ACCOUNTANT.

APPLICATIONS are invited from qualified accountants for the post of DIVISIONAL ACCOUNTANT to the Cambridge Division of the Board.

Applicants should be conversant with modern methods of accounting and should have extensive administrative experience and organising ability.

The salary will be not less than £1,250 per annum.

The successful applicant may be required to pass a medical examination and to subscribe to such scheme of superannuation as the Board may adopt.

Applications, which should reach the undersigned within fourteen days of the publication of this advertisement, should state age, qualifications, experience and present employment of the applicant, together with the names of two referees.

J. HUNTER-RIOCH,
Divisional General Manager.

Divisional Chief Office,
52, Sidney Street,
Cambridge.
October, 1951.

SOUTHERN GAS BOARD

NORTHERN DIVISION.

OXFORD AND DISTRICT
GAS UNDERTAKING.

WORKS ENGINEER.

APPLICATIONS are invited for the position of WORKS ENGINEER to the Oxford and District Gas Undertaking at a salary of £900 per annum rising by two annual increments of £50 to £1,000 per annum.

Applicants must be well qualified by education and experience to organise and control all the activities of a works producing 2,000 million cubic feet of gas a year in horizontal retorts and automatic carburetted water gas plant. The person appointed will be required to pass a medical examination and to contribute to any superannuation scheme which may be introduced by the Board.

A flat will be available at a reasonable rent if required.

Applications stating age, qualifications and experience, and giving the names of two referees, should be sent to the undersigned within 14 days of the appearance of this advertisement.

ALEXANDER TRAN,
Divisional General Manager.

Northern Divisional Offices,
Therm House,
St. Aldates,
Oxford.
October 11, 1951.

NORTH WESTERN GAS BOARD

BLACKBURN GROUP.

DEPUTY GROUP DISTRIBUTING ENGINEER.

APPLICATIONS are invited for the above position, at a salary within Grade A.P.T. XI (£645-£770 per annum).

The successful applicant will be required to assist the Group Distributing Engineer in his Group control and also be responsible for the distribution of gas in a part of the Blackburn District.

Applicants should hold the Higher Grade Certificate of the Institution of Gas Engineers and have experience in the design and installation of high pressure gas supply.

The successful applicant may be required to pass a medical examination and to subscribe to such superannuation scheme as the Board may adopt.

Applications, stating age, details of training, qualifications and experience, together with the names and addresses of two referees should reach the General Manager, North Western Gas Board (Blackburn Group), Cardwell Place, Blackburn, within twelve days of the publication of this advertisement.

NORTH WESTERN GAS BOARD

NORTH CHESHIRE GROUP.

INSTALLATIONS OFFICER—

MACCLESFIELD/BOLLINGTON DISTRICT.

APPLICATIONS are invited for the above position, at a salary within Grade A.P.T. VII (£500-£580 per annum) according to experience.

Candidates should hold the Higher Grade Certificate in Gas Engineering (Supply) and the Final City and Guilds Certificate in Gasfitting or Plumbing.

The successful applicant will be responsible, under the District Service Manager, for the organisation and control of fittings and maintenance staffs and workshop personnel, engaged upon the installation of gas meters and appliances.

The successful applicant may be required to pass a medical examination and to subscribe to such superannuation scheme as the Board may adopt.

Applications, furnishing personal details, particulars of training, qualifications and experience, together with the names and addresses of two referees should reach the General Manager, North Western Gas Board (North Cheshire Group), Gas Works, Portwood, Stockport, within fourteen days of the publication of this advertisement.

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CLOCK CONTROLLER REPAIRS.
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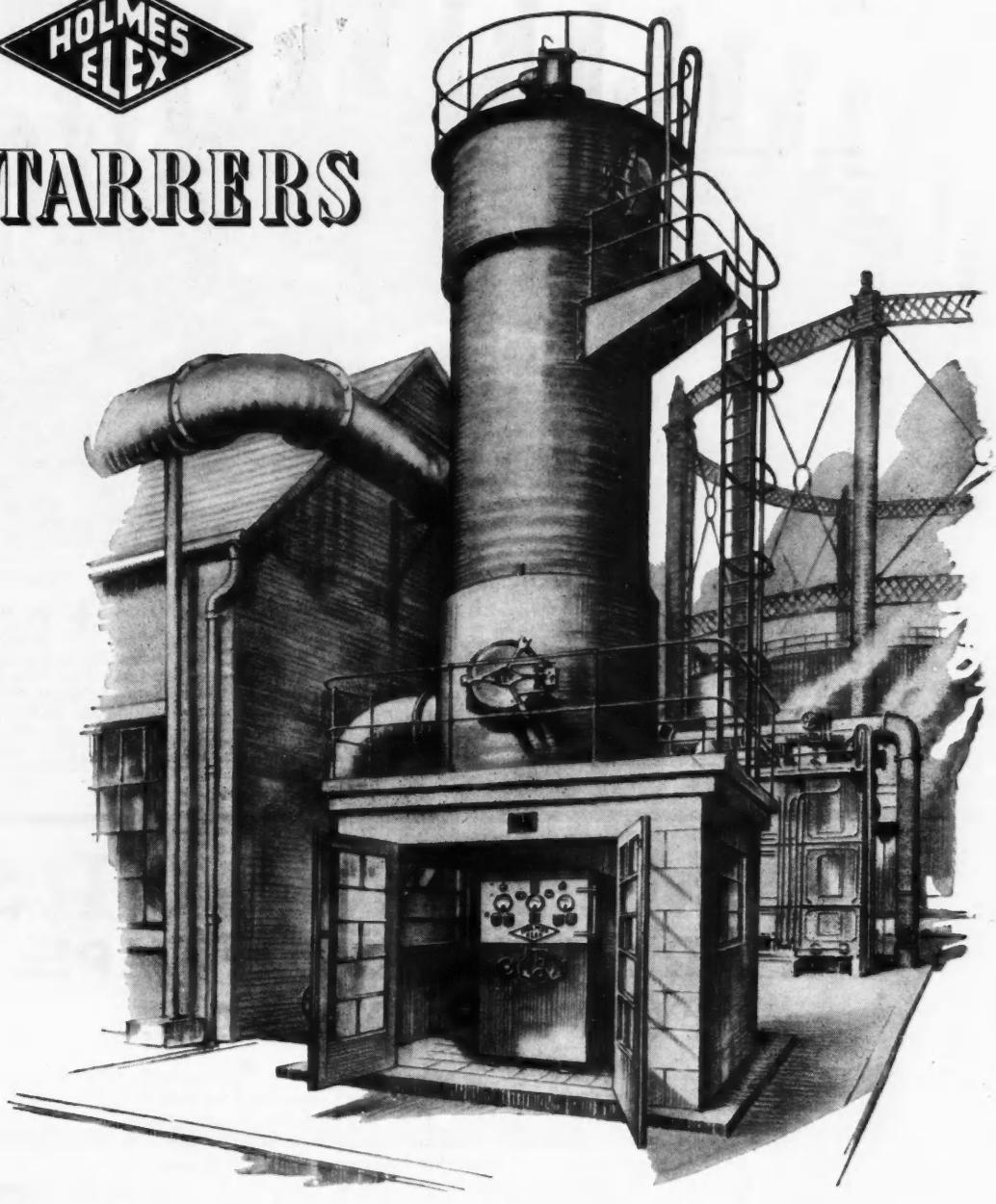

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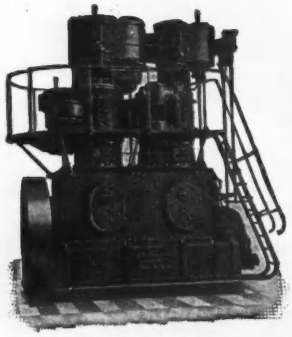

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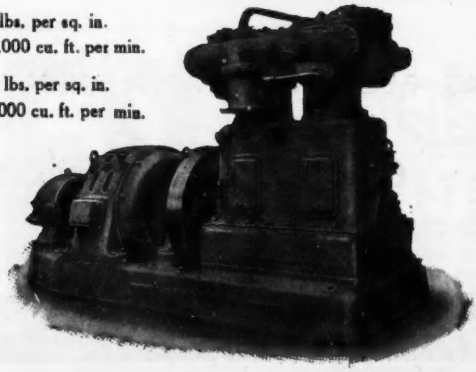

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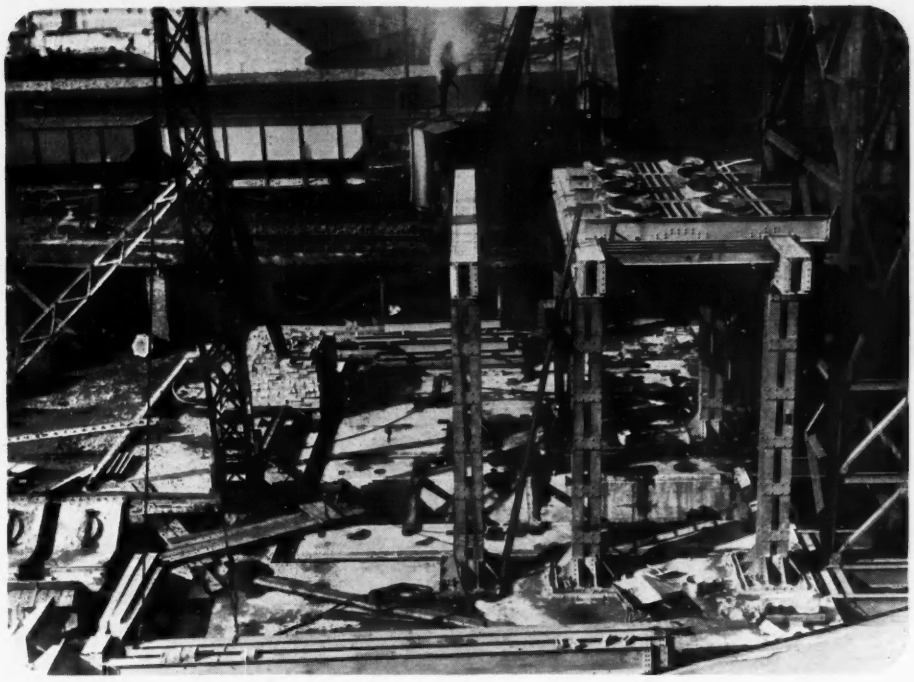

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